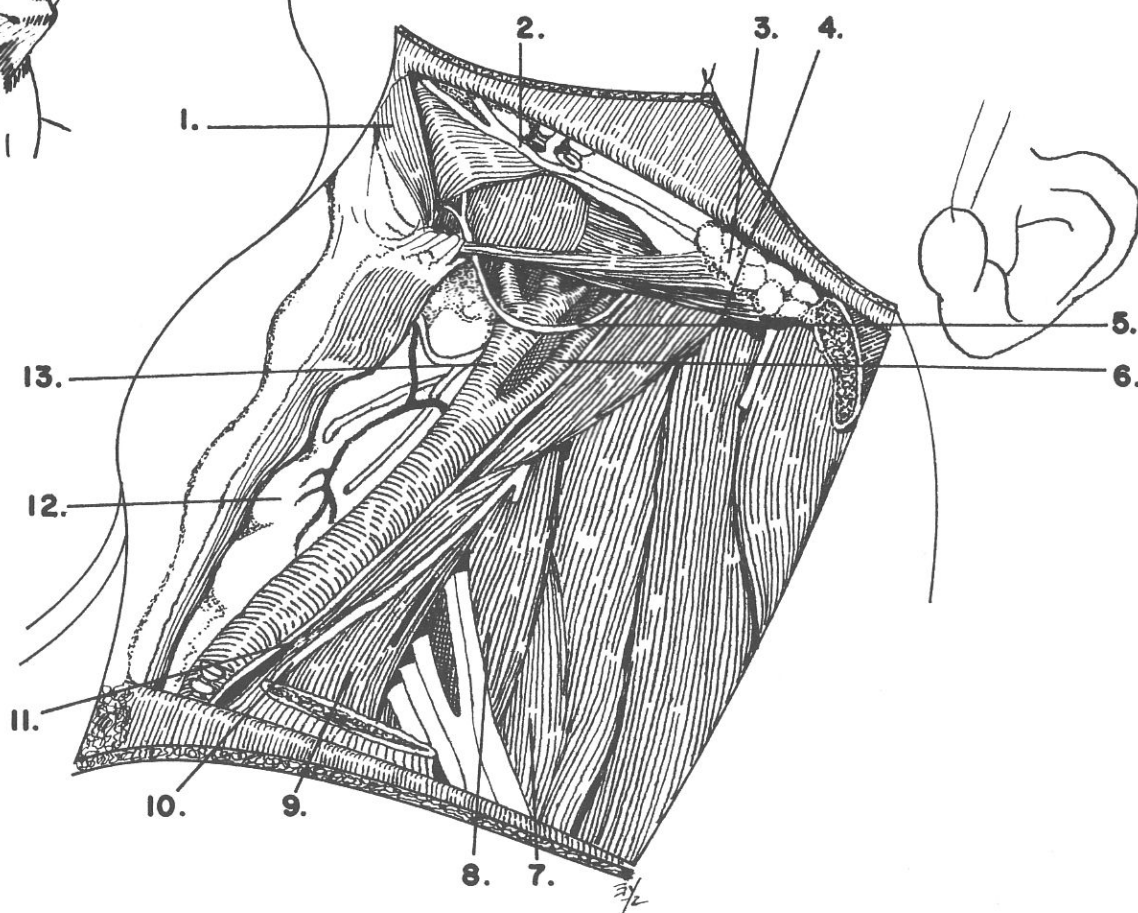




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Credits: All pictures are Official U.S. Navy Photographs unless otherwise indicated.

A striking front cover heralds the new "Head and Neck" section which makes its debut in this issue. The accomplished medical illustrator is HMC Gerald F. Sweeney, USN. CAPT Robert W. Cantrell, MC, USN will edit "Head and Neck" and has furnished the introductory editorial note which appears on page 3. We are proud to be the first to publish his splendid paper on metastatic disease in the neck.

The photo on page 2 reveals VADM George M. Davis, MC, USN, Surgeon General, visiting a military ward at Naval Hospital Port Hueneme, Calif. Accompanying the Chief, Bureau of Medicine and Surgery are (from left to right): HN Dennis G. Smith, CDR Alice M. Hines and LT Mary A. Rinaldo.

The continued support of Ms. S.B. Hannan, BUMED Code 2133, and the Illustration and Exhibits and Photography Divisions of the Medical Graphic Arts Dept., Naval Medical Training Institute, NNMCI, Bethesda, Md., is gratefully acknowledged.



from the Chief

After many years in Navy medical administration, I am convinced that one of our greatest problems in attracting young prospective medical and dental officers toward a military career is the ineptitude of our senior medical or dental officers to communicate adequately to young professionals early in their active duty.

Arbitrary rules, unreasonable attitudes, "It's so because I said it's so," and failure to demonstrate leadership based on example, knowledge and performance are repeatedly cited by our young colleagues as turning them off. One cannot please everyone and I do not condone permissiveness, sloppiness, nor an undisciplined approach but whenever unpopular or controversial orders are issued, our senior leaders should be able to explain their necessity clearly. Proper discussion concerning such leads to better understanding and satisfaction. Every policy, instruction or organizational plan should bear scrutiny and examination. If it is wrong, change it. If it is right, be able to defend it openly and persuasively. If it's beyond your control, submit it to higher authority or to us.

The majority of our career corps are outstanding professionals. Yet, one poor example can taint the whole group, particularly if this example is in a leadership or key role of Navy identity. Once again, I urge senior officers to visit frequently the areas under their responsibility and get to personally know those working at all levels, civilian and military. Indicate your willingness to discuss Navy medical matters. Everyone will benefit if such discussion is fostered with confidence, honesty and good faith. We have a great Medical Department. Let's sell it better.



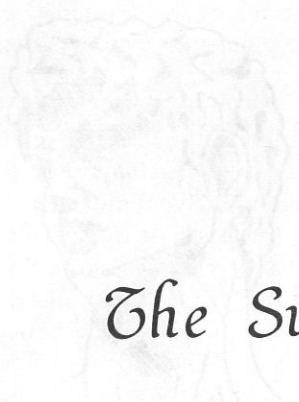


Head & Neck

With this issue, a new Head and Neck Section is inaugurated. The head and neck, with its complex anatomy and multiplicity of disease processes, has been the focus of many specialties. These interests have been illuminated at the various Head and Neck Conferences and Boards which now take place at various hospitals around the country. Some of the medical specialties which are interested in this region are General Surgery, Neurology, Neurosurgery, Ophthalmology, Otolaryngology, Pathology, Plastic Surgery and Radiology, as well as certain dental specialties, especially Oral Surgery.

Specialists in these fields, or others with articles of related interest, are invited to submit them for publication. The articles should be forwarded as indicated on the inside back cover of U.S. NAVY MEDICINE, or they may be sent to:

*CAPT Robert W. Cantrell, MC, USN
Contributing Editor, U.S. NAVY MEDICINE,
Head and Neck Section,
Naval Hospital
San Diego, California 92134.*



The Surgical Treatment of Metastatic Disease in the Neck

By CAPT Robert W. Cantrell, MC, USN,
Chief, Otolaryngology Service, Naval
Hospital San Diego, California 92134.

INTRODUCTION

The generally accepted treatment of cervical metastases from primary cancer of the head and neck is radical neck dissection. Whether combined with resection of the primary site, or used after control of the primary lesion with irradiation, it has improved the cure rate of cancer of the head and neck. The aim of radical neck dissection is the complete removal of all lymph-bearing tissue in the lateral cervical area.

HISTORY

Nineteenth century surgeons removed cervical lymph nodes containing metastatic carcinoma, but it remained for George Crile, Sr., in 1906⁴ to develop a systematic approach to the en bloc removal of cervical lymphatics. This work was not readily accepted, and of those who

were so treated, a high operative mortality resulted from prolonged surgery, shock, local infection or pneumonia. The development of radiation therapy after World War I permitted the use of this apparently less radical procedure, instead of surgery, despite poor cure rates achieved by radiation alone. By the 1930s the operative mortality had been somewhat reduced due to the use of local anesthesia. With the advent of blood banks, the development of antibacterial drugs, improvements in anesthesia and surgical techniques, an improved understanding of fluid and electrolyte balance, and the increasing use of tracheostomy, the morbidity and mortality significantly decreased. The techniques and writings of Hayes Martin served to popularize the procedure during the 1940-1960 period.

Composite resection, also called the commando procedure, which utilizes radical neck dissection in continuity with resection of the primary tumor, has further lowered the death rate for head and neck cancer.

INDICATIONS

The indications for neck dissection were listed by Martin in 1951:¹⁵

The above paper was presented at the International College of Surgeons' Fifth Western Hemisphere Congress conducted in San Diego, Calif., on 15 Nov 1972.

The opinions or assertions expressed in the above article are those of the author and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

1. Definite clinical evidence of cancer in cervical lymphatics is present.

2. The primary lesion should have been controlled or will be removed at the time of the neck dissection.

3. There is a reasonable chance of complete removal of cervical metastasis.

4. There is no clinical or roentgenographic evidence of distant metastasis.

5. Cure by neck dissection is more certain than by radiation therapy.

Generally, asymptomatic enlargement of cervical lymphatics in adults, especially when larger than 1 cm. and unilateral, should be considered cancer until proven otherwise. This should prompt a careful search of the oral cavity, pharynx, nasopharynx, larynx and sinus cavities for the primary lesion. Any suspicious area that is discovered must be biopsied and measured exactly, with its location carefully recorded. Once histologic proof of cancer is established, the neck mass or masses must be taken into consideration in the planned therapy. Therapy usually consists of surgery, irradiation, or a combination of these approaches. It is helpful if the surgeon consults with a radiation therapist prior to implementing any planned therapy, and it is better if the patient can be discussed first before a tumor board.

Occasionally, a very suspicious neck mass will be discovered, and after a meticulous search, no primary lesion can be found.^{9,10} In these cases, the mass is excised through an incision which may be extended into a neck dissection incision; a suitable specimen of tissue is sent for frozen section, and if cancer is present, a radical neck dissection is then performed directly.

CONTRAINDICATIONS

It has been stated that there are no medical contraindications to cancer surgery. This may be true, but certainly the morbidity and mortality of neck dissection are greater in the aged, or those with advanced organ system disease. The internist and the surgeon must evaluate coexisting medical problems, weighing them against the fact that untreated cancer is ultimately fatal.

Distant metastasis is usually a contraindication to neck dissection, but occasionally a palliative neck dissection might be indicated to remove a necrotic, foul-smelling cancer mass from the cervical region, to make a patient more comfortable or to allow for easier nursing care.

Intradermal metastasis indicates that the disease has invaded the dermal lymphatics. Even if the overlying

skin is included in the specimen, it is unlikely that the disease will be arrested.

Extension into the cervical vertebrae, or base of the skull rules out any hope for cure by a neck dissection.

MODIFICATIONS

Any modification of the classical neck dissection must be considered very carefully. Partial dissections, suprahyoid or supraomohyoid dissections, preservation of the internal jugular vein or the spinal accessory nerve^{2,18} may have a place in some cases. In general, if a node is palpable due to cancer, one can assume that other nodes contain microscopic disease and removal of only the palpable node is inadvisable. There is no place for piecemeal removal of nodes.

Bilateral neck dissections can be accomplished with a slight increase in morbidity and mortality. Whether to perform them simultaneously, or to stage them, is a difficult decision to be faced by the surgeon in each case. One must weigh the necessity for removing bilateral disease immediately against the increased mortality and occasional blindness that result from increased venous congestion.

The value of elective neck dissection has long been debated, and as early as 1951, Martin argued against it. Many authors have published statistics to support both sides of the argument.^{6,7} If one must enter the upper neck to resect the primary lesion, as in the case of a piriform sinus or floor of the mouth lesion, a neck dissection is probably indicated. If it is not done at this juncture, formidable scarring may well result from the neck dissection that becomes clearly indicated at a later date.

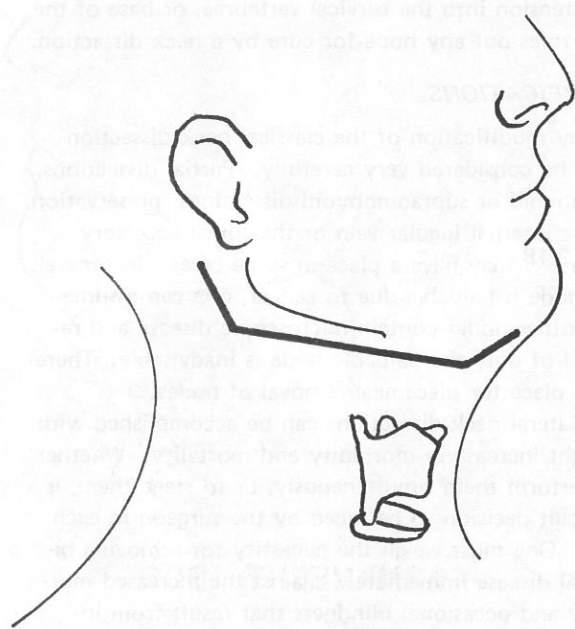
Generally, a neck dissection is usually performed in those cases at risk, where the chances are 30% or more that the primary cancer is associated with occult metastasis. The emergence of the immunologic aspects of cancer therapy,⁷ long advocated by George Crile, Jr., challenges the validity of former approaches to these clinical problems.

TECHNIQUE

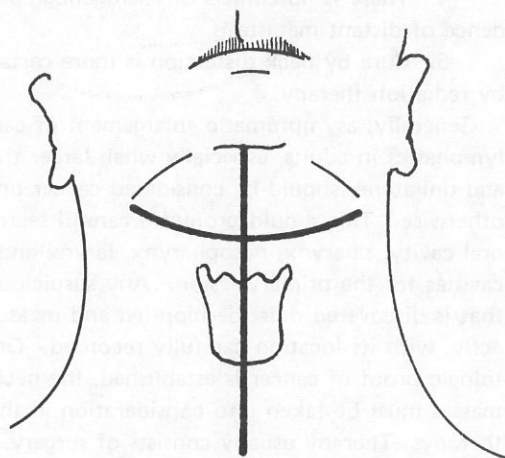
The boundaries of a neck dissection are the mandible superiorly, the midline anteriorly, the clavicle inferiorly, the anterior border of the trapezius muscle posteriorly, the platysma muscle externally and the deep fascial layer internally.

INCISIONS

There have been many skin incisions proposed since Kocher's original description. (See Figures 1-7) The double trifurcate described by Martin in 1951¹⁵ is commonly employed and offers good exposure.



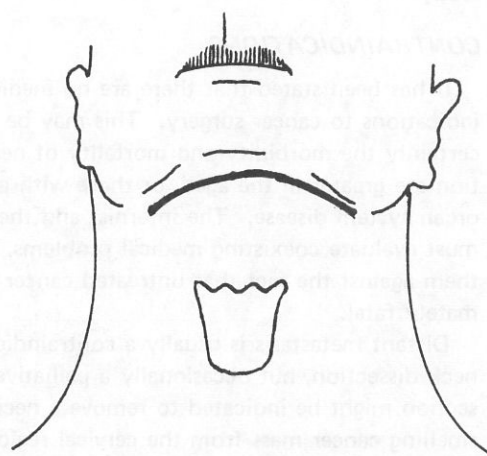
KOCHER, 1880



KUETTNER, 1898



DE QUERVAIN, 1900



STIEDA, 1901

Figure 1



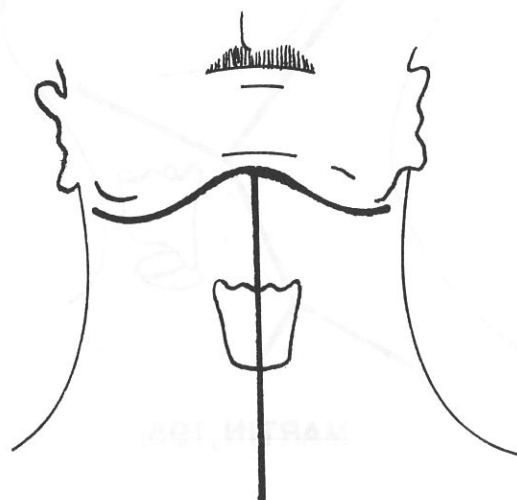
CRILE, 1905



ARMKNECHT, 1906



SEMKEN, 1934



SAUERBRUCH, 1934

Figure 2

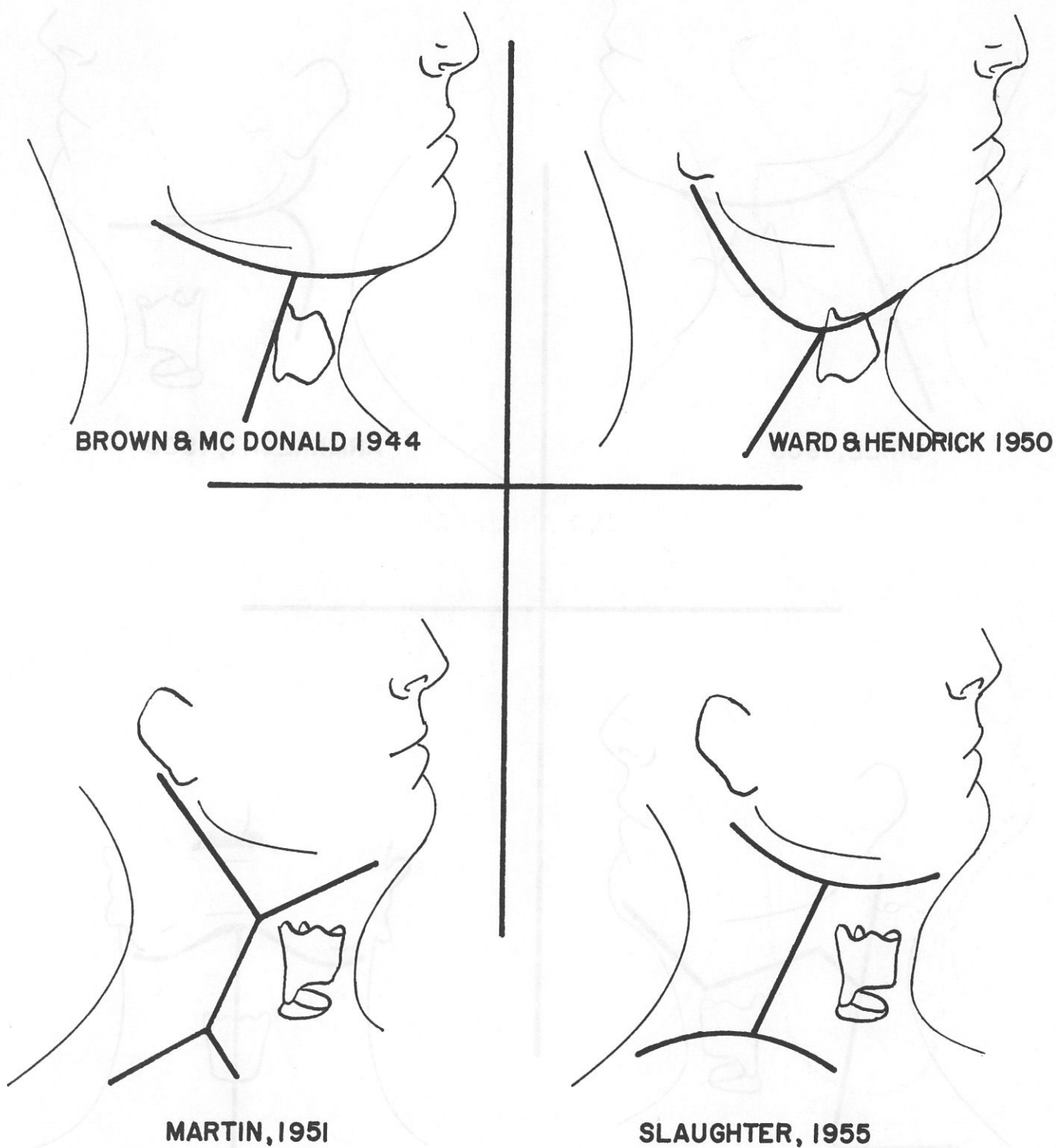


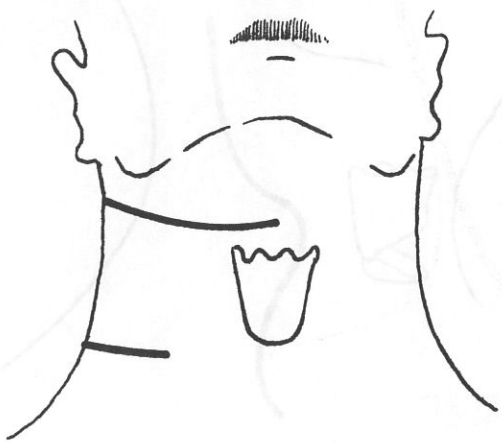
Figure 3



M.D. ANDERSON



Figure 4



MACFEE 1960



GRILLO & EDMUNDS

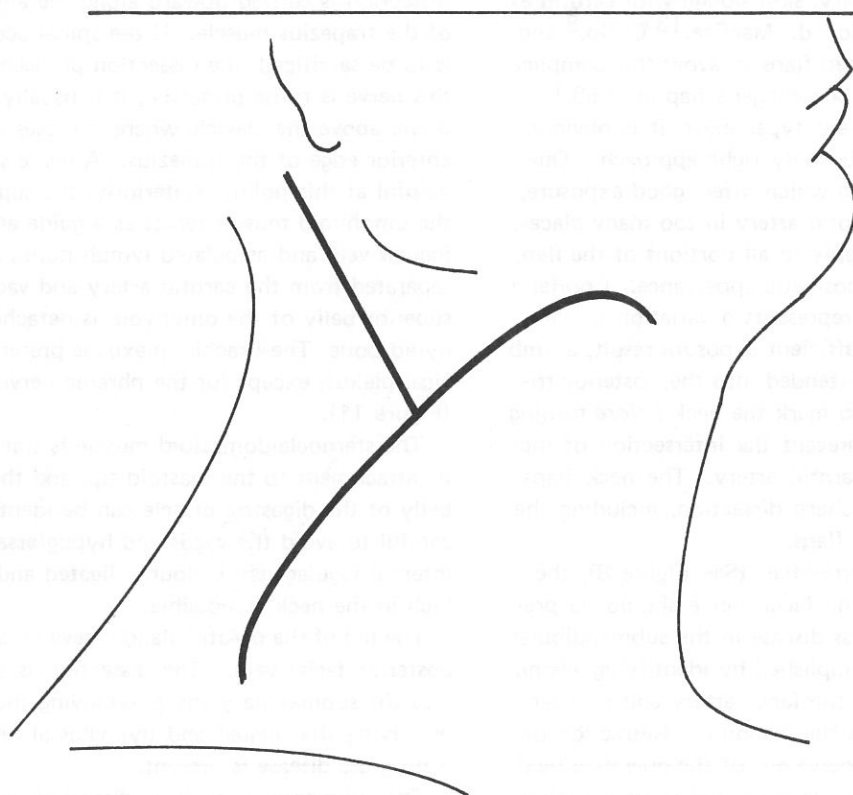


SCHOBINGER 1957

Figure 5



APRON FLAP



CONLEY, 1966

Figure 6



Figure 7

The problem presented by many of these was that in irradiated necks, especially where the incision intersected over the carotid artery, skin slough with carotid exposure commonly developed. MacFee,¹³ Grillo,⁸ and Schobinger,¹¹ all designed flaps to avoid this complication. Conley modified Schobinger's flap in 1966.¹

Since so many different types exist, it is obvious that no single flap is the only right approach. One should design an incision which offers good exposure, does not overlie the carotid artery in too many places, presents good blood supply to all portions of the flap, and permits a pleasing cosmetic appearance. I prefer a curving incision which represents a variation in the apron flap. Should insufficient exposure result, a limb of the incision can be extended into the posterior triangle. It is important to mark the neck *before* turning the head, in order to prevent the intersection of incisions that overlie the carotid artery. The neck flaps are then elevated with sharp dissection, including the platysma with the skin flaps.

In elevating the superior flap (See Figure 8), the mandibular branch of the facial nerve should be preserved if there is no gross disease in the submandibular space. This is best accomplished by identifying, clamping, cutting and ligating the facial artery and vein separately where they cross the mandible. Retraction of the vessels elevates this nerve out of the operative field.

The sternomastoid muscle is severed at its insertion into the clavicle and sternum (Figure 9). One may then expose the carotid sheath containing the internal jugular vein, the vagus nerve and the common carotid

artery; the *external* jugular vein is ligated and transected; the sternocleidomastoid muscle is reflected upward, exposing the fascia over the scalenus muscles. The phrenic nerve is identified deep to the fascia and preserved. The carotid sheath is opened; the internal jugular vein is separated from the carotid artery and vagus nerve, and doubly ligated (Figure 10). A suture ligature is placed through it while the vein is intact. At this point care must be taken not to injure the subclavian vein, or the thoracic duct, if working on the left side. If the latter structure is damaged, it must be ligated to prevent the formation of a chylous fistula.

The dissection is carried across the neck, superior to the clavicle and the anterior border of the trapezius muscle. The transverse cervical and transverse scapular vessels are identified, ligated, and cut. Care must be exercised not to injure the phrenic nerve or the brachial plexus at this point. Staying external to the fascia over the scalenus anticus muscles usually prevents this complication. One must also watch for the abnormally high apical pleura or subclavian vein. The posterior belly of the omohyoid muscle can sometimes serve as a guide during this portion of the procedure. This muscle belly is transected as far postero-inferiorly as is possible. The dissection is carried upward along the anterior border of the trapezius muscle. If the spinal accessory nerve is to be sacrificed, the dissection proceeds rapidly. If this nerve is to be preserved, it is usually located about 3 cm. above the clavicle where it passes beneath the anterior edge of the trapezius. A nerve stimulator is helpful at this point. Anteriorly, the superior belly of the omohyoid muscle serves as a guide and the internal jugular vein and associated lymph nodes are carefully separated from the carotid artery and vagus nerve. The superior belly of the omohyoid is detached from the hyoid bone; The brachial plexus is preserved; The cervical plexus, except for the phrenic nerve, is sacrificed (Figure 11).

The sternocleidomastoid muscle is transected near its attachment to the mastoid tip, and the posterior belly of the digastric muscle can be identified. Being careful to avoid the vagus and hypoglossal nerves, the internal jugular vein is doubly ligated and divided as high in the neck as possible.

The tail of the parotid gland is severed along with the posterior facial vein. The dissection is then directed into the submaxillary space, removing the contents but preserving the lingual and hypoglossal nerves therein, if no gross disease is present.

The submental triangle is dissected, crossing the midline to the opposite anterior belly of the digastric muscle.

In dissecting the specimen free from its attachments

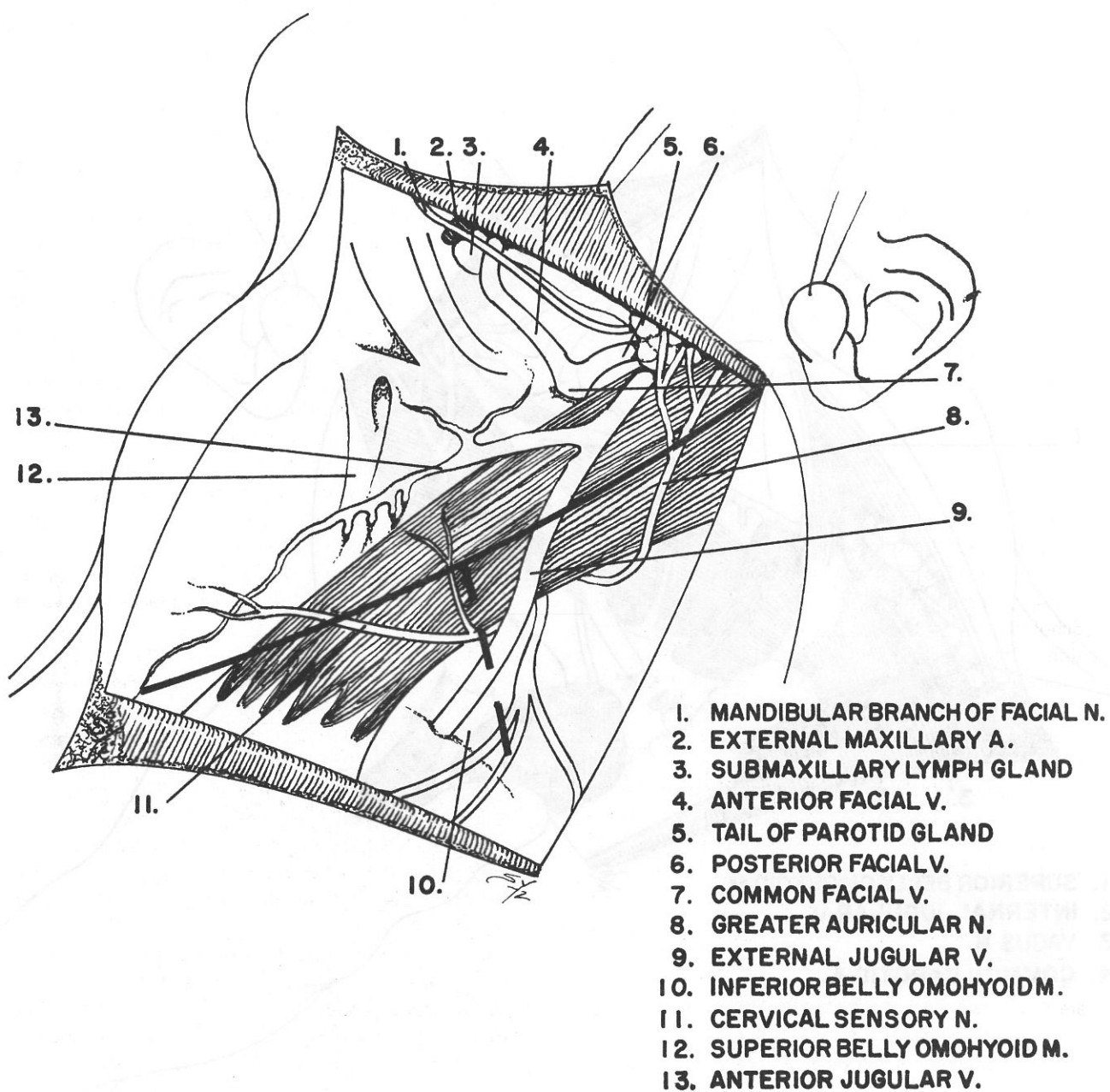


Figure 8

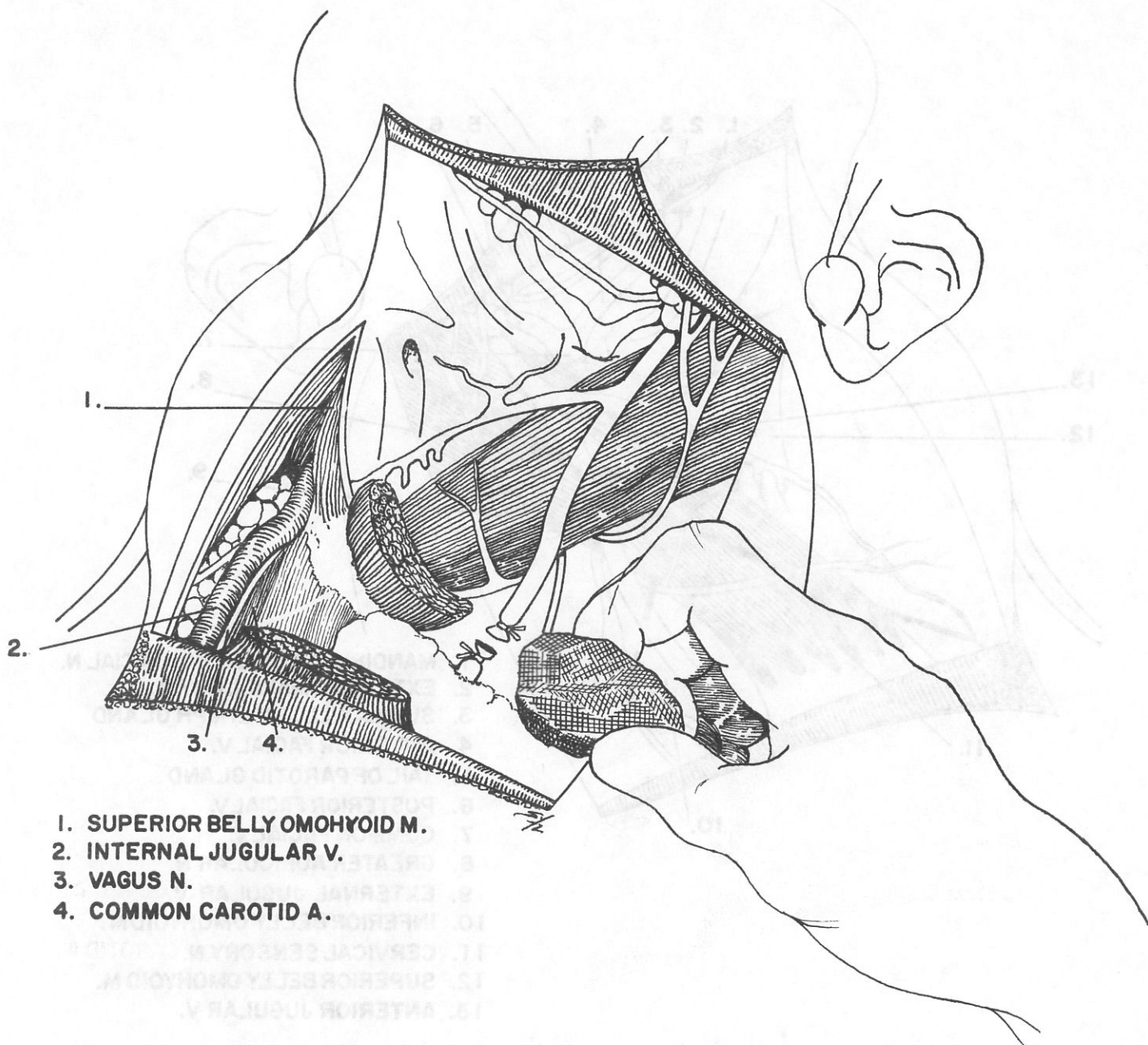


Figure 9

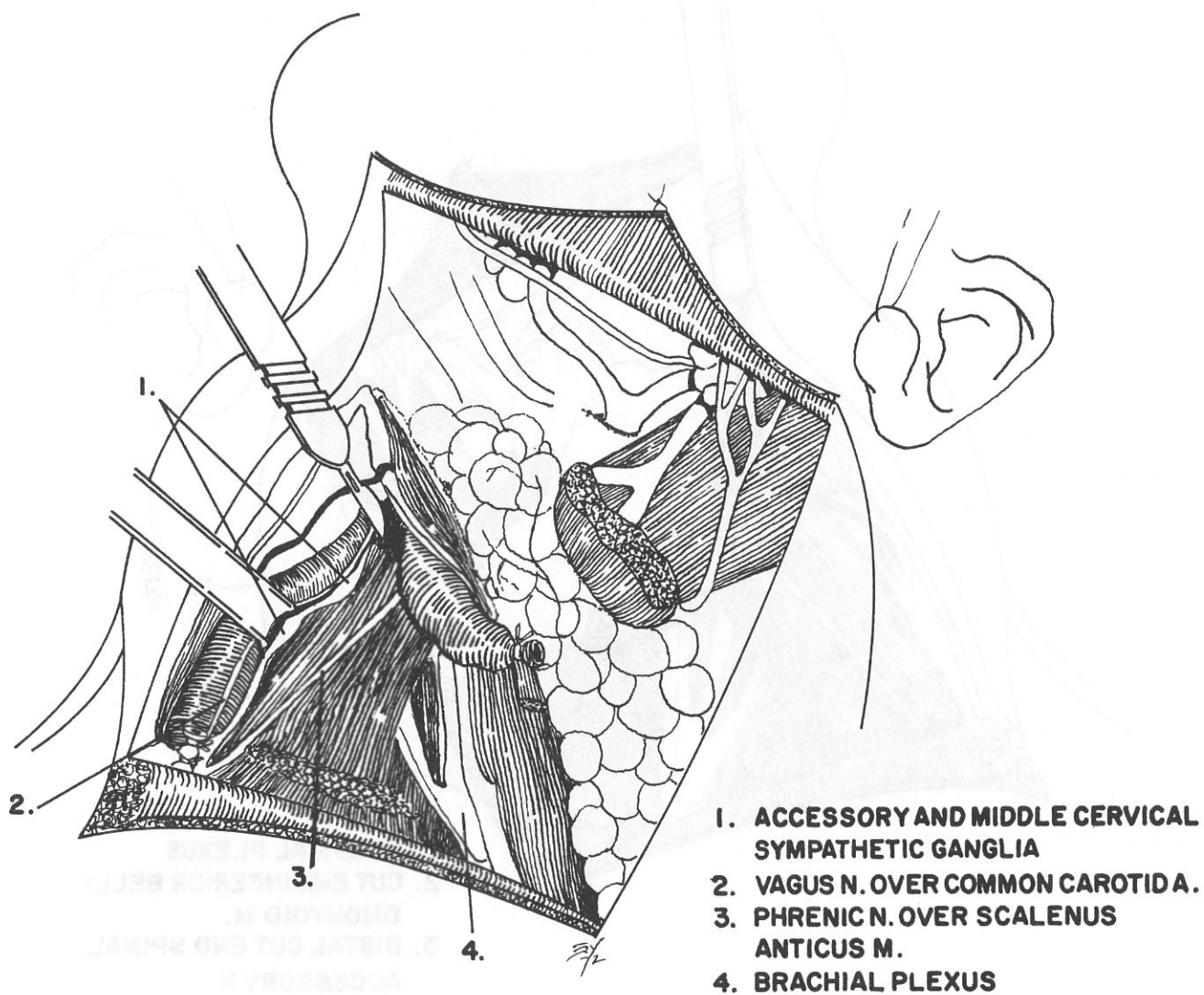


Figure 10

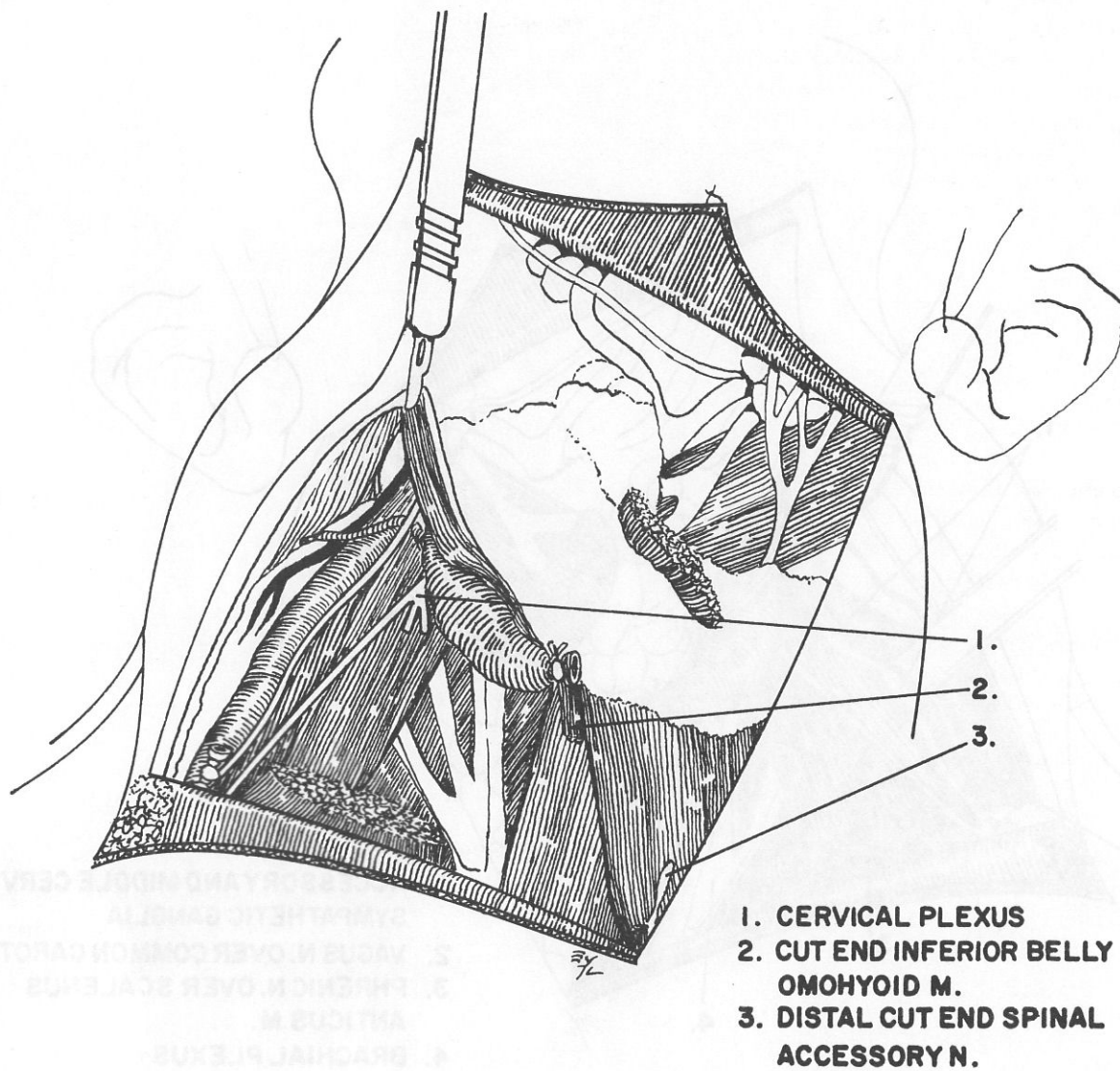
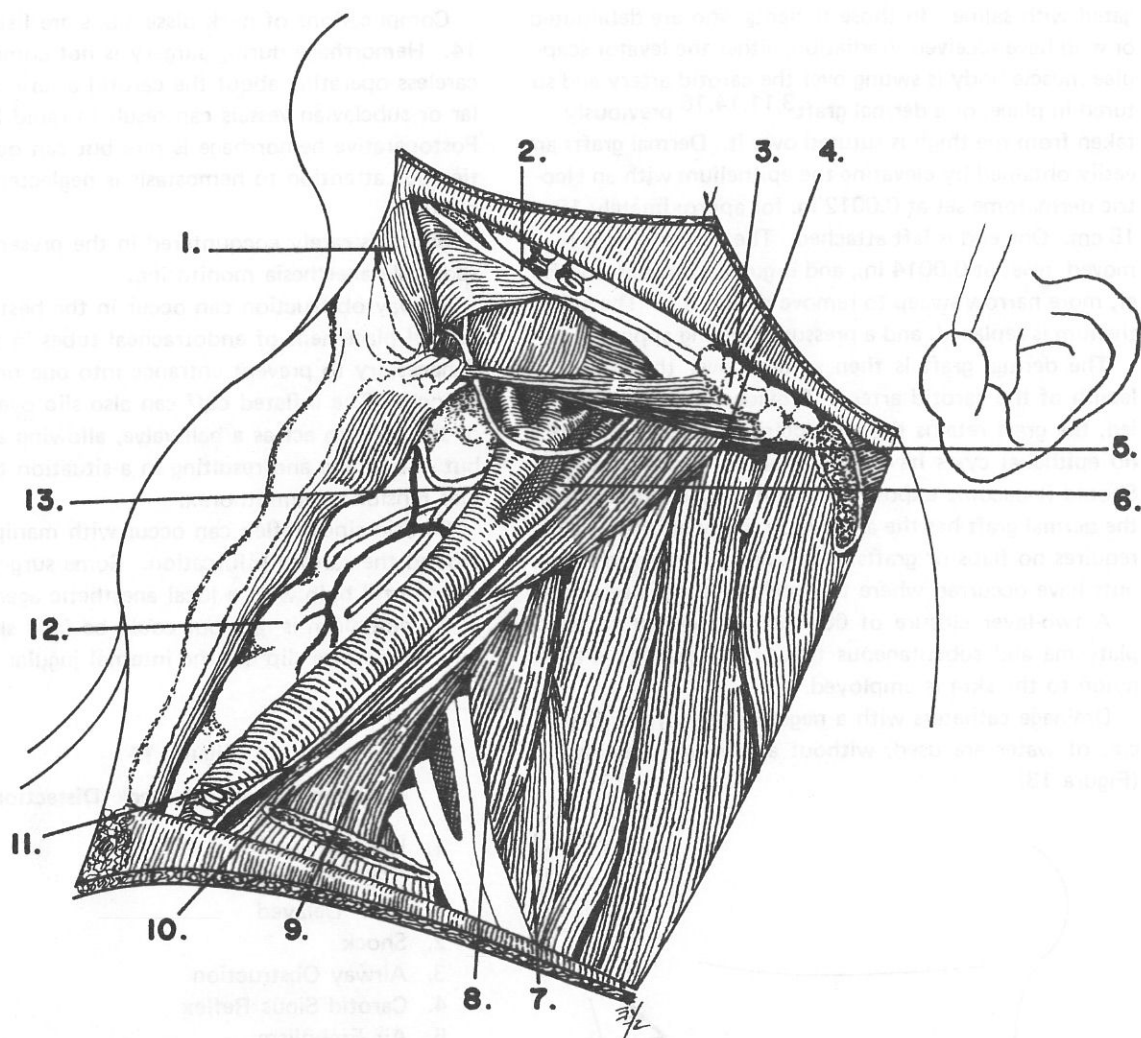


Figure 11



- | | |
|--|--------------------------|
| 1. ANTERIOR BELLY DIGASTRICUS M. | 7. SCALENUS POSTERIOR M. |
| 2. MANDIBULAR BRANCH OF FACIAL N. | 8. SCALENUS MEDIUS M. |
| 3. TRANSECTED PORTION OF TAIL OF PAROTID | 9. SCALENUS ANTICUS M. |
| 4. POSTERIOR BELLY DIGASTRICUS M. | 10. PHRENIC N. |
| 5. HYPOGLOSSAL N. | 11. VAGUS N. |
| 6. INTERNAL CAROTID A. | 12. THYROID GLAND |
| 13. EXTERNAL CAROTID A. | |

Figure 12

near the bifurcation of the carotid, care must be exercised not to impair the superior laryngeal nerve as it passes deep to the external carotid artery. (Figure 12)

Upon completion of the dissection, the neck is irrigated with saline. In those patients who are debilitated or who have received irradiation, either the levator scapulae muscle body is swung over the carotid artery and sutured in place, or a dermal graft^{3,11,14,16} previously taken from the thigh is sutured over it. Dermal grafts are easily obtained by elevating the epithelium with an electric dermatome set at 0.0012 in. for approximately 10-15 cm. One end is left attached. The dermatome is removed, reset at 0.0014 in., and is guided through another, more narrow sweep to remove the dermis. The epithelium is replaced, and a pressure dressing applied.

The dermal graft is then sutured over the entire length of the carotid artery. Provided it remains buried, the graft retains the characteristics of dermis and no epithelial cysts have been reported to develop. Should it become exposed through wound breakdown, the dermal graft has the ability to rapidly epithelize and requires no flaps or grafts. No reports of carotid blow-outs have occurred where this technique has been used.

A two-layer closure of 000 chromic catgut to the platysma and subcutaneous tissue, and number 4-0 nylon to the skin is employed.

Drainage catheters with a negative pressure of 8-10 cm. of water are used, without a pressure dressing (Figure 13).

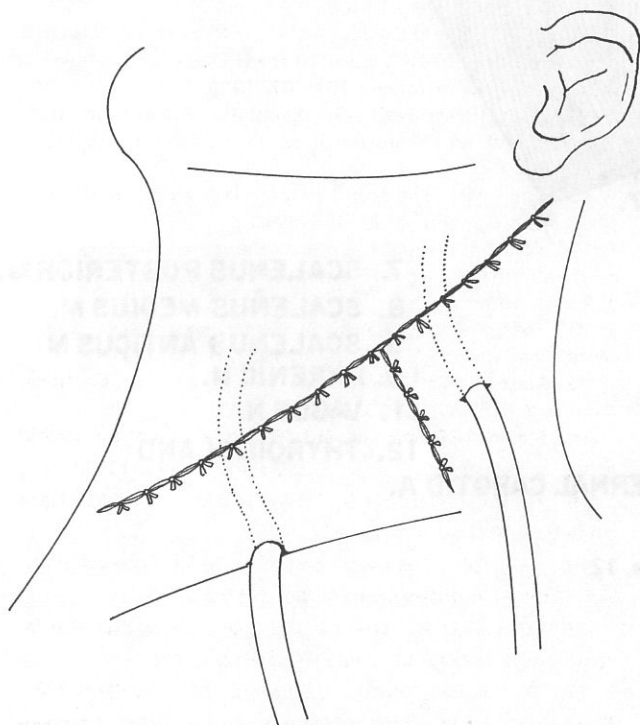


Figure 13

The drainage catheters can usually be removed in two or three days, after drainage measures less than 50 cc/24 hr. The skin sutures are removed in seven to ten days.

Complications of neck dissections are listed in Figure 14. Hemorrhage during surgery is not common, but careless operating about the carotid artery, or the jugular or subclavian vessels can result in rapid blood loss. Postoperative hemorrhage is rare but can occur if meticulous attention to hemostasis is neglected prior to closure.

Shock is rarely encountered in the presence of responsible anesthesia monitoring.

Airway obstruction can occur in the best hands, and careful placement of endotracheal tubes in the trachea is necessary to prevent entrance into one or the other bronchi. The inflated cuff can also slip over the end of the tube to act as a ball valve, allowing air to enter but not escape and resulting in a situation that resembles tension pneumothorax.

Carotid sinus reflex can occur with manipulation around the carotid bifurcation. Some surgeons inject the carotid bulb with a local anesthetic agent.

Air embolism is rare but could be fatal should the inferior ligature slip off the internal jugular vein. In

Figure 14

Complications of Neck Dissection

1. Hemorrhage
 - a. Immediate
 - b. Delayed
2. Shock
3. Airway Obstruction
4. Carotid Sinus Reflex
5. Air Embolism
6. Nerve Damage
7. Chylous Fistula
8. Wound Infection
9. Necrosis of Flaps
10. Carotid Artery Rupture
11. Increased Intracranial Pressure
12. Blindness
13. Salivary Fistula
 - a. Oro-cutaneous
 - b. Parotido-cutaneous
14. Fracture or Dislocation of Cervical Vertebrae
15. Pulmonary
 - a. Pneumothorax
 - b. Atelectasis
 - c. Pneumonia
 - d. Lung Abscess

such an unhappy event, the patient must be turned on his left side to trap the air in the right ventricle which is then aspirated. If the latter maneuver is not successful, the chest must be immediately opened, the heart massaged until the leak is repaired, the air removed, and normal sinus rhythm reestablished.

Nerve damage is usually the result of careless surgery and/or anatomic variants. The nerves most frequently injured are the phrenic, hypoglossal, lingual and brachial plexus.

Chylous fistula is usually the result of injuring the thoracic duct and failing to recognize and ligate it. Chylous fistulas can also occur on the right side. Wound infection, necrosis of flaps and carotid artery rupture represent graduated steps in a potentially lethal sequence of events. The development of infection beneath the flaps, and/or poor blood supply, leads to necrosis. If the carotid artery has not previously been covered by a dermal graft or muscle flap and it becomes exposed, great care and attention must be given as arterial wall rupture may be imminent. Prophylactic ligation is practiced by some, especially if the wall of the artery appears dried out. Increased intracranial pressure and occasional blindness occur only with bilateral simultaneous neck dissection, generally, but theoretically these complications can occur with vascular anomalies or thrombosed contralateral veins.

Oro-cutaneous salivary fistulas usually occur only when the oropharynx is entered during a composite resection.

Parotido-cutaneous fistulas are uncommon and result from cutting a salivary duct when transecting the tail of the parotid gland.

Fractures or dislocations of the cervical vertebrae may result from rough or extreme positioning of the head of the unconscious patient.

Pulmonary complications continue to occur but are well controlled with early ambulation, intermittent positive pressure breathing, satisfactory tracheobronchial toilet and antibiotics.

SUMMARY

Radical neck dissection, either unilateral or bilateral is the best treatment available today for metastatic disease in the neck. Its purpose is the removal of all lymph-bearing tissue from the lateral cervical area.

Meticulous surgical techniques combined with good anesthesia, antibiotic coverage and closed suction drainage combine to produce low mortality and morbidity.

Acknowledgment:

A special note of appreciation is due HMC Gerald F. Sweeney, USN, who not only produced the splendid

illustrations for this article but also designed the mast-head which is used for this section. His well-executed sketch of Michelangelo's *David* is particularly apropos and well suited to the specialty represented herein.

Special thanks are also extended to medical photography technicians HM3 Lewsader and HM3 Jack G. Fowler, USN, who have been extremely helpful in the preparation of the photographs and slides associated with this article.

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FORENSIC SCIENCE AT THE ARMED FORCES INSTITUTE OF PATHOLOGY: ITS ROLE IN MILITARY MEDICINE

By CAPT Charles J. Stahl, MC, USN;*
COL Richard C. Froede, MC, USAF;** and
MAJ James G. Zimmerly, MC, USA;† Armed
Forces Institute of Pathology (AFIP), Wash-
ington, D.C. 20306.

Recent events in our country have directed the attention of the public, as never before, toward the forensic sciences. Recognizing the need for expertise, many States have moved to replace the lay coroner with the professionally-staffed medical examiner system. Changes in the criminal justice system, as well as advances in criminalistics, have contributed to the advancement of the forensic sciences. Although the

specialist in forensic pathology is often believed to be associated only with violent or unexplained deaths, he is concerned with broader interests and responsibilities. Investigation and interpretation of deaths by violence, such as homicide or suicide, represent less than 25% of the total number of cases for which the forensic pathologist is responsible. By definition, the word *forensic* (Latin-forensis: forum, public) implies that this special field of pathology pertains to open discussion, to public debate, and to the courts. The forensic pathologist deals with medical problems of injurious portent that affect the public and the Nation. He is concerned with public health, welfare, and safety. He has an interest in current issues and problems that might affect the health of the community. He applies scientific knowledge in criminal and civil matters so that justice may be served. On occasion he may be able to offer recommendations or suggestions for legislative action. He is devoted to public service in either the military or civilian community. Forensic

*Chief, Forensic Sciences Division, AFIP; Consultant in Forensic Pathology, Bureau of Medicine and Surgery, Department of the Navy; Professorial Lecturer, The George Washington University.

**Chief, Forensic Pathology Branch, AFIP; Consultant in Pathology, Office of the Surgeon General, Department of the Air Force; Professorial Lecturer, The George Washington University.

†Chief, Legal Medicine Section, Forensic Pathology Branch, AFIP; Associate Professorial Lecturer, The George Washington University.

The opinions or assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting the views of the Department of Defense or the Departments of the Army, Navy, or Air Force.

pathology is a special field of pathology concerned with the scientific aspects of untoward effects of the interaction between man and his environment. The forensic sciences include not only forensic pathology but also the field of forensic medicine and the disciplines of forensic psychiatry, forensic toxicology, forensic serology, jurisprudence, criminalistics, and questioned documents. The forensic sciences, therefore, are concerned with the application of scientific knowledge to the law in civil, criminal, and behavioral matters, to the end that justice shall be served.

The military services have also recognized the need for expertness in the forensic sciences. As the incidence of medicolegal problems, tort claim actions, crimes against the person, abuse of drugs, and environmental health problems increase, the necessity of having more knowledgeable individuals in this field becomes more apparent. The staff of the Armed Forces Institute of Pathology has developed not only keen interest but also considerable experience in three fields within the forensic sciences over the past 20 years: forensic pathology, forensic medicine, and forensic toxicology.

Historical Aspects

The Army Medical Museum and the Army Institute of Pathology, forerunners of the Armed Forces Institute of Pathology (AFIP), placed emphasis on the forensic aspects of military pathology. After the proposal of Brigadier General William Alexander Hammond (The Surgeon General, United States Army) on 21 May 1862, "to collect . . . all specimens of morbid anatomy, surgical or medical, which may be regarded as valuable; together with projectiles and foreign bodies removed, and such other matters as may prove of interest in the study of military medicine or surgery,"^{10a} the AFIP has developed from the concept of a repository for medical curios into a complex triservice organization playing a significant role not only in the field of pathology but also in the advancement of military medicine.²¹

In the past, as now, there had always been interest in wound ballistics. The staff of the Army Medical Museum participated in the autopsy of Abraham Lincoln,^{10b} and in 1896 Dr. William Gray used an X-ray machine to locate a bullet in a gunshot wound.^{10c} The studies of Callender and French,⁴ as well as those of Silliphant,¹⁹ Holmes, Enos, and Beyer,¹¹⁻¹³ were major contributions to the understanding of wound ballistics and body armor. This interest in wound ballistics culminated in the publication of a text, edited by Beyer, in 1962.² Evaluation of

soldiers killed in Korea by Enos, Holmes, and Beyer^{7,8} contributed greatly to the knowledge of coronary artery disease in young adults. Subsequent studies included estimation of survival time after injury⁶ and its relation to coronary artery disease.¹⁴

With these concepts in mind and cognizant of the need for increasing knowledge and skill, the AFIP recognized forensic pathology as a singular, special field in 1951. By 1955, the need for greater knowledge of the hazards in the military environment was apparent. This need was stressed in the lectures on wound ballistics, battle wounds, decompression sickness, and high-altitude anoxia which were presented during the dedication ceremonies for the new building.¹ During 1955, the Department of Defense designated the AFIP as the headquarters for the Joint Committee on Aviation Pathology, consisting of representatives from the United Kingdom, Canada, and the U.S.^{10d} An Aviation Pathology Section was established to investigate and to study aircraft accidents, a problem of particular importance and interest at that time. During the subsequent years, a wealth of scientific information has been accumulated in the fields of aerospace pathology and toxicology.^{5,9,15,23}

A Military Environmental Pathology Division, created at the AFIP in 1959, placed within one Division all related branches having a direct interest in military problems. This Division, now known as the Forensic Sciences Division, includes Forensic Pathology, Aerospace Pathology, and Toxicology Branches. The nucleus of the Division is the special field of forensic pathology because it is recognized as the special field of pathology devoted to these problems.

Concurrent with the development of these concepts within the AFIP, there was increasing interest in this special field of pathology throughout the U.S. The Registry of Forensic Pathology, sponsored by the College of American Pathologists, was established in 1958 as a component of the American Registry of Pathology.^{18,22} In 1959, the American Board of Pathology began formal examinations for certification of pathologists in the special field of forensic pathology, and in 1962 the AFIP became the first military medical facility for residency training in forensic pathology which was approved by the American Board of Pathology, and the Council on Medical Education and Hospitals of the American Medical Association. The Registry of Accident Pathology, established with the support of the Department of Transportation in 1966, has contributed to scientific investigation and prevention of vehicular accidents.

Forensic Pathology in the United States

There are over 334,000 physicians in the U.S., including over 10,000 specialists in pathology (Table I).

TABLE I

Fields of Physicians in the United States*

Total physicians	334,028
General practice	57,948
Medical specialties	77,214
Surgical specialties	86,042
Other specialties	89,641
Pathology	10,283
Forensic pathology	200

*Source: Center for Health Services Research and Development, 31 December 1970.

The two major fields of pathology are anatomic pathology and clinical pathology. Special fields of pathology for which advanced residency training is required include forensic pathology, neuropathology, hematology, blood banking, medical microbiology, radioisotopic pathology, and medical chemistry. Of the 23 centers for advanced residency training in forensic pathology, the AFIP is the only approved military medical facility. Less than 50% of all the positions for residents in forensic pathology are filled each year in the U.S. (Table II). Between 1958 and 30 June 1971, 229 pathologists were certified by the American Board

TABLE II

Residency Training in Pathology and Forensic Pathology*

	Pathology	Forensic Pathology
Training centers, 1970	611	22
Total positions, 1 Sep 70	3,603	41
Total filled, 1 Sep 70	2,335	20
Percent filled, 1 Sep 70	65	49

*Directory of Approved Internships and Residencies, 1971-72.

of Pathology as Diplomates in the special field of forensic pathology. Petty¹⁷ noted in 1969 that 22 of 164 forensic pathologists in the U.S. were over the age of 62 years and that only about 50% of the total number of these specialists were actively engaged in the practice of forensic pathology. A survey by the Maryland Medical Legal Foundation in 1971 revealed that only 70 of the 229 certified forensic pathologists in the U.S. devote the major portion of their professional activity to this special field.

At the present time there are 12 forensic pathologists, including eight career medical officers, on active duty with the military services. Only six of the 12 forensic pathologists are assigned to duties which represent the full-time practice of this specialty (Table III).

TABLE III

Forensic Pathologists in the Armed Forces

Diplomates, Forensic Pathology, American Board of Pathology	
Total in U.S. (to 30 June 1971)	229
Total on active duty in Armed Forces (to 31 August 1972)	12
Career Medical Officers	8
Full-time forensic pathologists	6

Of the eight forensic pathologists who are career medical officers in the military services, seven are Diplomates of the American Board of Pathology in three fields: anatomic pathology, clinical pathology, and forensic pathology. One pathologist is certified in anatomic pathology and forensic pathology. It is interesting that all of the pathologists from the Army, Navy, and Air Force who received advanced training in forensic pathology at the AFIP between 1962 and 1972 remain on active duty, except for the retirement of two pathologists who had over 20 years of military service each (Table IV). Furthermore, all of these pathologists, except for one who has not submitted an application to the Board for examination, have become Diplomates in the special field of forensic pathology. Except for retirement, therefore, there has been 100% retention of career medical officers who are certified in this special field.

Forensic Science at the AFIP

Since 1951 there has been progressive development of programs in the forensic sciences, including forensic

TABLE IV

Residency Training in Forensic Pathology at
Armed Forces Institute of Pathology, 1962-1972*

	Army	Navy	Air Force
1962-1963	0	1(A)	0
1963-1967	0	0	0
1967-1968	1(R)	0	0
1968-1969	0	0	1(A)
1969-1970	1(R)	0	0
1970-1971	1(A)	1(A)	0
1971-1972	0	0	1(A)

*Approved June 1962.

(A) Active-duty career medical officer

(R) Retired medical officer

pathology, forensic medicine, aerospace pathology, and toxicology, at the AFIP. These programs are directly related to the triservice support of interests pertaining not only to military medicine but also to those of other military and Federal agencies. The Forensic Sciences Division (Table V), composed of related branches and sections with a multidisciplinary staff, contributes to the missions of consultation, education, and research.

Consultation.

All cases of medicolegal significance referred for consultation are reviewed by the staff of the branches within the Forensic Sciences Division, and consultative service is offered on medicolegal, aerospace pathology, and toxicologic problems occurring not only in the military services but also within the Federal Government

TABLE V

Forensic Sciences Division, AFIP, 1972

Forensic Pathology Branch
Legal Medicine Section
Wound Ballistics Section
Accident Pathology Section
Aerospace Pathology Branch
Joint Committee on Aviation Pathology
Altitude Chamber
Toxicology Branch
Department of Defense Drug Detection
Quality Control Laboratory

and pertaining to the national interest. In 1971 the staff of the Division received over 5,000 requests for consultation, representing about 15% of the total number of cases received annually by the Institute. Selected cases are considered valuable for postgraduate education or research, and they are added to the wealth of material in the Registry of Forensic Pathology and the Registry of Accident Pathology. A diagnostic index file, established in 1959 with 801 forensic cases, has increased yearly since that time, permitting computer retrieval of significant data from thousands of medicolegal cases.²⁰

The Division has diversified medicolegal and military expertise available to contributors to the Institute. These personnel resources include not only experienced forensic pathologists but also preventive medicine specialists, toxicologists, criminal investigators, attorneys, veterinary pathologists, and flight surgeons. Members of the Division have participated in boards of inquiry and depositions. They have given testimony in court-martial, have participated in medicolegal investigations of national significance, and have provided testimony for Federal commissions.

The consultative service, though primarily for the Armed Forces, extends to other Federal and civilian agencies. Consultative services have been provided to the Federal Bureau of Investigation; the Bureau of Narcotics and Dangerous Drugs; the Department of Justice; the Department of Transportation; the Office of Public Safety of the Agency for International Development, Department of State; the Homicide Unit of the Metropolitan Police Department, District of Columbia; the United States Army Judiciary; the United States Army Claims Service; and the Office of the Judge Advocate General, Department of the Navy. The staff of the Legal Medicine Section has also provided consultative service on an ad hoc basis to the Food and Drug Administration, the Health Services and Mental Health Administration, and the Secretary's Commission on Medical Malpractice of the Department of Health, Education and Welfare.

During FY 1972, 130 cases, as well as 80 telephone calls, resulted in over 200 military medicolegal consultations by the Legal Medicine Section. The individual dollar values of the 130 submitted cases ranged from \$2,500 to \$6,000,000 per claim. The average claim was about \$200,000. The total amount of claims studied in FY 1972 was over 25 million dollars. Based upon the consultative services provided by the Legal Medicine Section, the estimated savings to the Federal Government was in excess of one million dollars, with a combined savings of over \$400,000 in two of these claims. The unique professional qualifications and

experience of the staff has provided expertise in matters of medical litigation not available elsewhere in the military services.

Education.

The Forensic Sciences Division conducts an extensive educational program. Each year the AFIP has offered courses in the forensic sciences. Since 1951, an annual one-week course in forensic pathology has covered a wide variety of subjects in that field. Nearly 10% of all pathologists in the U.S. have completed this course, and each year the number of applicants, including lawyers, investigators, and forensic pathologists, increases. The first Forensic Sciences Symposium held in 1959 stressed the relationships between law, medicine, and law enforcement. A symposium of this type has been given at frequent intervals since that time. In 1971-1972, the staff of the Forensic Sciences Division conducted five of the 16 postgraduate courses in continuing education given at the AFIP, including Forensic Pathology, Aerospace Pathology, Advanced Workshop in Forensic Toxicology, Accident Pathology, and Pathology of the Aquatic Environment. The Dental and Oral Pathology Division also conducts a unique annual course in Forensic Dentistry.

Educational activity in the forensic sciences is not limited to the annual postgraduate courses in continuing education. By concurrent action of the American Board of Pathology and the Council on Medical Education and Hospitals of the American Medical Association, the AFIP was approved for residency training in the special field of forensic pathology in June 1962. This one-year program of advanced residency training is available to career military pathologists who are Diplomates of the American Board of Pathology, either in anatomic pathology, or in both anatomic and clinical pathology. The residency is designed to cover the scientific methods and techniques applied and used in the practice of forensic pathology. It consists of a planned progression of study under the supervision of an experienced and qualified staff. The methods utilized include practical experience in the performance of medicolegal autopsies, aircraft-accident and criminal investigations, toxicologic examinations, and criminalistic procedures. In order that residents shall obtain experience in medicolegal investigations and postmortem examinations, they not only participate in an active medical examiner's system but also provide supervised consultative support, upon request, to pathologists at Walter Reed General Hospital, Bethesda Naval Hospital, and other local military hospitals. There is participation in a wide variety of related educational activities, including short training courses in physical anthro-

pology, in narcotics and dangerous drugs, as well as investigative seminars conducted by other Federal agencies. Training in the use of a law library and as an expert witness in medicolegal cases is also provided.

Scientific exhibits designed for the continuing education of physicians and pathologists have been prepared for display at national meetings. The Medical Museum of the AFIP contains new exhibits prepared by the staff for public education. Recently a series of educational aids have been prepared for distribution by the American Registry of Pathology concerning gunshot wounds, cutting and stabbing wounds, histopathology of poisons, the histopathology of missile wounds, and identification of unknown human remains.

Fellowship training in forensic science is provided to military lawyers, medical officers, and law-enforcement officers. This one-year program evolved from informal training in forensic medicine begun by the Office of Legal Counsel at the AFIP in 1961. By 1964 a Legal Medicine Section was established within the Forensic Pathology Branch, and a formal program in forensic medicine, known as the United States Army Inservice Professional Training Program in Forensic Medicine, was authorized by the Department of the Army. From 1964 through 1971 the fellowship, successfully completed by 14 officers, consisted of studies at the advanced level to integrate the professional knowledge of the forensic pathologist, the lawyer, and the investigator. The curriculum included instruction in clinical medicine, general pathology, forensic medicine, law, and law enforcement. Opportunities were provided for on-the-scene observation of clinical procedures, patient care, laboratory activities, emergency room function, autopsies, criminal investigations, and trial procedures. Time was spent in a medical examiner's office to observe on-the-scene investigation of sudden unexpected or violent deaths. There was training in physical anthropology and toxicology. Affiliations were afforded with other Federal agencies for training in the investigation of narcotic and drug-abuse cases and in advanced investigative techniques. Included in the legal field were studies of military and civilian cases, statutes, professional liability, criminal actions, disability compensation, and court procedures.

In 1972 the Master of Science in Forensic Science program of the Armed Forces Institute of Pathology-George Washington University was established. This program, unique not only in the military services but also in the civilian community, will provide career incentive to many military officers as well as an attractive educational opportunity consistent with the needs of the military services. It is believed that this program will have a significant role in retention of career

officers. During the year, the first group of four officers completed the requirements for the Master of Science degree.

The Armed Forces Institute of Pathology-George Washington University program has a broad orientation, encompassing several diverse disciplines and including most aspects of the forensic sciences. The program has increased steadily in its appeal to military lawyers, criminal investigators, military police officers, and medical officers; 11 officers are enrolled for the year 1972-73.

The staff of the Legal Medicine Section contributes to the educational programs of others, both within the AFIP and outside of the Institute. In 1971-72 the staff presented papers on a wide range of subjects, including presentations to the U.S. Army Criminal Investigation Division Arson Seminar, the District of Columbia Public Defender's Course, the 7th and 8th International Medical-Legal Seminars, the Annual Meeting of the American College of Legal Medicine, the Annual Meeting of the American Academy of Clinical Toxicology, the Air Force Forensic Medicine Conference, and the Walter Reed Army Institute of Research Course in Global Medicine.

Medicolegal cases are often of such complicated nature as to require considerable time for the medical and legal research necessary for proper evaluation and interpretation. The facilities of the AFIP include an excellent medicolegal library, a complete Army Field Law Library, and access to the libraries of the Department of Justice, National Library of Medicine, and the local law schools. Medical expertise, particularly in the fields of general pathology, forensic pathology, and legal medicine, is readily available. Consultative assistance in other medical specialties is also available at either Walter Reed Army Medical Center or National Naval Medical Center.

Research.

The staff of the Forensic Sciences Division has devoted considerable effort to research of military importance, particularly in forensic pathology, forensic medicine, toxicology, and aerospace pathology. The results of this research, though important primarily to the military services, will ultimately contribute to the improvement of medicolegal and other investigative procedures in the civilian community. The Division has an active intramural research program. Projects completed by members of the Division over the past ten years have included topics related to toxicology, accidental injuries, aircraft and landcraft accidents, homicide, suicide, and wound ballistics. During the period 1965 to 1971, members of the staff published

76 scientific articles in various professional journals and textbooks.

The research projects in toxicology have been related to carbon monoxide, detection of narcotics and drugs, aerospace toxicology, and chemical changes resulting from exposure to toxic agents. The problem of carbon monoxide poisoning in fires, particularly as related to aircraft accidents, has been studied. The staff of the Toxicology Branch has developed methods of national significance for detection of microgram quantities of drugs by gas chromatographic, spectrophotometric, and spectrophotofluorimetric techniques.

In 1971, selected members of the staff of the Division provided administrative and professional support to the Department of Defense, and the staff of the Toxicology Branch completed the toxicologic studies for the project, "A Pilot Study of Drug Excretion in the Urine of Military Separates." Based upon information derived from this study, regional laboratories were established in each service for detection of narcotics and drugs of abuse. Subsequently, the Department of Defense Drug Detection Quality Control Laboratory was established at the AFIP to support this significant program.

Interest in wound ballistics and the investigation of missile wounds has led to completion of studies and the publication of scientific articles of military importance. The Wound Ballistics Research Facility in the Wound Ballistics Section, Forensic Pathology Branch, will provide unique capabilities for better understanding of the pathologic effects of missiles, as well as for the medicolegal investigation of specific cases.

The staffs of the Accident Pathology Section, Forensic Pathology Branch, and the Registry of Accident Pathology have not only correlated the pathologic effects of injuries with the data pertaining to the circumstances of certain types of accidents but have contributed to the development of a medicolegal autopsy report form designed for computer retrieval of data. The results of these studies were presented during the International Conference on Accident Pathology held in Washington, D.C., in 1968.³

Proposal for a Military Medical Examiner System

The military services are capable of providing and delivering to military personnel and their dependents extraordinary and excellent medical and dental care throughout the world. There exist inherent flexibility and resources to modify and improve the health-care system. New concepts that are considered beneficial to the health of the military population are quickly and easily adopted.

A new concept consistent with the regionalization of health-care facilities in the Armed Forces is the development of a medical examiner system. By the application of well-established model legislative and organizational principles¹⁶ related to the forensic sciences in all geographic areas of the military community, it is possible to provide the consultative, educational, and research support required for the evaluation and interpretation of medicolegal cases. A system of this type would contribute not only to safety but also to preservation of medical and scientific evidence in criminal cases and to the evaluation of medical evidence in tort actions.

The nucleus for the development of a military medical examiner system is available through the Forensic Sciences Division of the Armed Forces Institute of Pathology, which provides not only central facilities but also the educational programs, personnel resources, and direction for research programs.

Forensic scientists at the AFIP would provide timely consultative support for all medicolegal cases; institute multidisciplinary educational programs for medical, legal, and investigative personnel; and establish relevant military programs for research.

Gradual expansion of the medical examiner's system to include resources in forensic pathology and toxicology at regional health-care centers would provide commanders of military bases, hospitals, legal agencies, and investigative agencies with the necessary expertise not only for medicolegal consultative services but also for impartial presentation of medical evidence in judicial proceedings, for standardization of medicolegal investigative procedures, and for uniform reporting and statistical analysis of preventable deaths. A system of this type would provide career incentive for retention of trained and experienced professional personnel, a central resource for education and research in medicolegal problems, unified jurisdiction consistent with the concept of regional health care, and a means to contribute to health and safety among military personnel by timely recognition of hazards.

Conclusion

The Forensic Sciences Division of the Armed Forces Institute of Pathology has contributed greatly to the three major functions of the Institute: consultation, education, and research. The knowledge that has been obtained through experience and by research has been utilized not only for consultative services and education of military officers but also in criminal and civil matters for the administration of justice.

The consultative services in forensic pathology,

aerospace pathology, forensic toxicology, and forensic medicine are unique, for they are not available elsewhere in the Armed Forces. The residency program in forensic pathology is the only advanced program in this special field available to qualified medical officers at a military medical facility. The Armed Forces Institute of Pathology-George Washington University Master of Science in Forensic Science Program provides a unique educational experience and incentive to career officers. The record of retention for career officers who have completed these programs has been excellent. The consultative, educational, and research missions, as well as professional personnel resulting from the various educational programs, enhance the concept for the support of regional health-care centers.

An objective for the future is the development of a medical examiner system for the Armed Forces that would not only contribute to improved health care of military personnel and their dependents but also would serve: to promote safety and prevention of unnecessary death and injury; to contribute to military justice; and to promote the application of the forensic sciences to medical litigation, and to civil and criminal matters.

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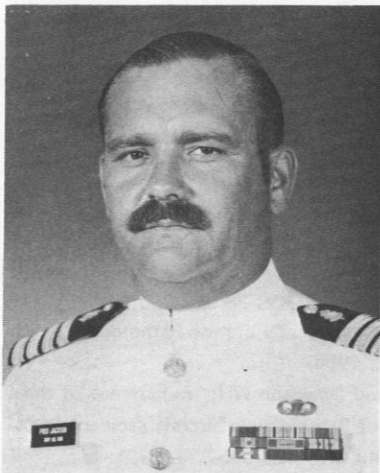
NAVAL RESERVE DENTAL SYMPOSIUM

A Naval Reserve Dental Symposium was held in conjunction with the Annual Session of the American Dental Association in San Francisco, Calif., on 30 Oct 1972. The program included a presentation by RADM John P. Arthur, DC, USN, Chief of the Navy Dental Corps, entitled "Navy Dental Corps - 1972."

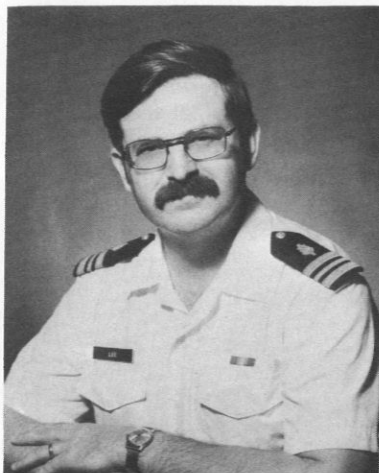
CAPT Roman G. Ziolkowski, DC, USNR-R (Rear Admiral Selectee), from Pomona, Calif., spoke on "Reserve Career Motivation." The principal speaker, CAPT Oliver L. Norman, USN, Office of the Chief of Naval Operations, spoke on the subject, "The Total Soviet Threat."



NAVAL RESERVE DENTAL SYMPOSIUM — Participants in a symposium which was held in conjunction with the Annual Session of the American Dental Association are, from left to right: CAPT O.L. Norman, USN; Rear Admiral Selectee R.G. Ziolkowski, DC, USNR-R; RADM J.P. Arthur, DC, USN, Chief of the Navy Dental Corps; and CAPT P.E. Farrell, DC, USN. 🍷



CAPT Frederick E. Jackson, MC, USN



LCDR Wayland S. Lee, MC, USN



CAPT Jacob R. Morgan, MC, USN

1972 AMSUS

The Association of the Military Surgeons of the United States held its 79th Annual Meeting 10-13 December 1972 at the Convention Center, San Antonio, Tex. The theme of the convention was focused on "Federal Medicine: A National Resource." At this meeting, several members from the five Federal medical services were presented awards in recognition of their recent achievements and contributions to military medicine. Six members of the Navy Medical Department were among the award recipients.

CAPT Frederick E. Jackson, MC, USN, received The Joel T. Boone Award for his outstanding service to the Association. This award was established in 1969 by the AMSUS Executive Council as a tribute to VADM Boone, MC, USN (Ret.). ADM Boone, who was awarded the Congressional Medal of Honor, is one of the most decorated medical officers in our history and is the first military medical officer to have attained three-star rank. He served as personal physician to three U.S. Presidents and is also a former Chief Medical Director of the Veterans Administration. A bronze plaque and a \$500 honorarium, under the sponsorship of Ciba Pharmaceutical Company, were presented to CAPT Jackson in recognition of his outstanding service and contributions to the advancement of the objectives of the Association of Military Surgeons. CAPT Jackson is Chief, Department of Neurological Surgery, Naval Hospital Camp Pendleton, Calif. His numerous accomplishments in the neurological surgery field are recognized internationally.

LCDR Wayland S. Lee, MC, USN, was selected to receive The Federal Medical Residents Award for his consistent outstanding performance as a resident in otolaryngology as a clinician, teacher and capable researcher. This award, consisting of a scroll and an honorarium of \$500, was initiated in 1970 by the Purdue Frederick Company and is the second such award given. Dr. Lee is serving in the Naval Hospital San Diego, Calif.

CAPT Jacob R. Morgan, MC, USN, was presented The Casimir Funk Award which honors the memory of Dr. Casimir Funk, the discoverer of vitamins. Established in 1968 in cooperation with the USV Pharmaceutical Corporation, the award is presented for outstanding accomplishment in the field of cardiovascular disease. The award consists of

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a scroll and an honorarium of \$500. CAPT Morgan was cited for his outstanding contributions as an investigator, teacher, and clinician. He is the Head, Cardiology Service, Naval Hospital San Diego, Calif.

CAPT Bill C. Terry, DC, USN, was awarded The Peter M. Margetis Award for his outstanding contributions to the advancement of the practice of oral surgery. The award, consisting of a plaque and an honorarium of \$500, honors the memory of COL Peter M. Margetis, Army Dental Corps, and was established in 1970 by the Association and the Star Dental Manufacturing Company. It is presented for outstanding contributions in the field of dentistry. CAPT Terry is Chief, Dental Service, Naval Hospital, NNMC, Bethesda, Md.

CDR Frank M. Crittenden, Jr., MC, USN received The James Clarke White Award which honors Dr. White, a pioneer in the field of clinical and research dermatology. This award is sponsored by Eli Lilly and Company and consists of a bronze plaque and an honorarium of \$500. Dr. Crittenden has distinguished himself in clinical and research dermatology and his astute clinical observation led to his developing a simple, effective and safe method of removing tattoos. The method is called salabrasion and involves brisk rubbing of the tattoo with moistened gauze dipped in table salt. Dr. Crittenden is a staff member of the Naval Hospital Portsmouth, Va.

LCDR Adolph R. Dasler, MSC, USN received The Major Gary Wratten Award for his outstanding contributions in field military medicine. The Award honors the memory of Major Gary Wratten, MC, USA who died while testing the Medical Unit Self-Contained Transportable (MUST) hospital equipment under operational conditions in Vietnam. Consisting of a bronze plaque and an honorarium of \$500, the award was established by The Garrett Corporation. For the past six years, LCDR Dasler has served with distinction as Head of the Heat Stress Laboratory at the Naval Medical Research Institute, NNMC, Bethesda, Md. LCDR Dasler's outstanding leadership has resulted in the designing and implementation of a comprehensive heat stress research program for both shipboard and field military medicine.

The 80th Annual Meeting of the Association of Military Surgeons of the United States will be held at Washington, D.C., 2-5 Dec 1973.



CAPT Bill C. Terry, DC, USN



CDR Frank M. Crittenden, Jr., MC, USN



LCDR Adolph R. Dasler, MSC, USN

The Expected Nursing Role in Total Hip Replacement

By LCDR Norma R. Coyle, NC, USNR, Educational
Coordinator Nursing Supervisor; and LCDR Ruth
E. Purinton, NC, USN, Charge Nurse, Orthopedic
Service; Naval Hospital Boston, Chelsea, Mass.

A relatively new addition to the orthopedic surgeon's armamentarium is the total hip joint prosthesis. This complex engineering process has become a *fait accompli*. Joint replacement is an effective tool in the treatment of hip joint disabilities. A knowledge of the "expected role" on the part of nursing personnel is basic to the proper selection of cases, careful surgical technique, close adherence to details, avoidance of complications and satisfactory rehabilitation period.

To enlighten, guide, and teach nursing personnel at Naval Hospital Boston, the authors conferred with selected nursing personnel at the New England Baptist Hospital (Boston), where hundreds of total hip replacements have been performed. For an audience of 155

nursing and allied health personnel from the staff of the Naval Hospital and surrounding community hospitals, a film demonstrating the surgical procedure for creating a "new hip" in the operating room was presented. CAPT Jan G. deWaal, MC, USN (Chief of Orthopedics), LCDR William D. Shea, MC, USN (staff orthopedic surgeon), and Clayton Booth, LPN (Chief Orthopedic Technician, New England Baptist Hospital) addressed the group, focusing attention on the "expected role" of nursing personnel. CAPT deWaal stressed the state of the art, including the artistic requirement for perfect and excellent results.

PATIENT TEACHING

What type of patient is a good candidate for this surgical procedure? Ages have ranged from 11 to 90 years. Ideal candidates present rather constant pain secondary to severe arthritis and trauma, that prevents adequate ambulation. The condition may be unilateral or bilateral. According to Technician Booth, a

The above paper was developed by the authors as a part of the Nursing Service's inservice education program, and a special workshop on total hip replacement that was conducted at Naval Hospital Boston in April 1972.

The opinions or assertions expressed in the above article are those of the authors and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

tremendous sense of professional gratification results when a patient who entered the hospital in a stooped position, with obvious pain and the appearance of being short in stature, is seen to emerge smiling, free from pain, and standing at a height of 6 ft. The transformation can be dramatic.

Ideally the patient should be hospitalized a few days before surgery to commence instruction and prepare for rehabilitation. What is the patient taught? He visits the intensive care area where he will spend his first night postoperatively. He receives instruction from the nurse practitioner, orthopedic technicians, and physical therapy personnel. Ultimate success is often determined by the degree of *motivation*. The patient must have the "spirit," and the nursing personnel must provide the "know-how" in nursing care. Compassion and care are vital prerequisites for effective management of these patients, CAPT deWaal emphasized. Other important aspects of clinical management include immobilization and exercise in a highly individualized regimen. Dr. Shea commented: "Muscles have to motor this new joint." The bed, frame, and splint are *tailored* to fit the patient. Nursing personnel must place the patient *on* the bed, not *into*, Mr. Booth stressed repeatedly. "Make

your nursing an art; Strive for patient comfort; Your goal is a patient free from pain, who will be able to walk around."

NURSING REGIMEN

Preoperative Nursing Considerations.

Since the patient is usually admitted to the hospital several days prior to surgery, the health team is afforded the opportunity to prepare the patient and the family for the many essential tasks involved in achieving a successful hip replacement.

Following admission, thorough evaluation of the patient by the orthopedic service ensures that a prosthesis is indicated. The patient is also thoroughly examined by the medical staff to be certain that he is in optimum health to undergo a major operative procedure. During the preoperative evaluation period, the nursing staff should conduct several patient-family interviews to determine the extent of the patient's present limitations in order to establish realistic short and long-term goals, and an effective nursing intervention plan. Realistic goals and patient motivation are two

PATIENT CARE PLAN NAVMED 6550/1 (4-66)						882-TRRNT-28885A
S/N-0105-216-5000						
ACTIVITY	BED REST	BRP	CHAIR	x AMBULATORY	OTHER	
BATH	BED	PARTIAL	x SELF	TUB	x SHOWER	
DIET	NPO	LIQUID	SOFT	x REGULAR	SPECIAL	
SPECIAL INSTRUCTIONS						
N.P.O. AFTER MIDNIGHT OF DAY PRIOR TO SURGERY						
ACCOMPANY PATIENT TO O.R.						
ELASTIC STOCKINGS FOR BOTH LEGS TO BE WORN BY PATIENT TO O.R.						
DATE		NURSING MEASURES				
ADMISSION		ROUTINE VITAL SIGNS				
		PHYSICAL THERAPY TO DEMONSTRATE PATIENT EXERCISES PRIOR TO SURGERY				
		PHYSICAL THERAPY TO INSTRUCT PATIENT IN CRUTCH WALKING PRIOR TO SURGERY				
		BALKAN FRAME/TRAPEZE/BALANCED SUSPENSION TRACTION FITTED TO PATIENT PRIOR TO SURGERY				
		LAPIDUS AIR FLOW MATTRESS FOR BED WITH INSTRUCTION FOR PROPER POSITION IN BED				

Figure 1.—Sample Preoperative Patient Care Plan.

ACTIVITY	BED REST	BRP	CHAIR	AMBULATORY	X OTHER	ACTIVITY AS
BATH	BED	X PARTIAL	SELF	TUB	SHOWER	TOL.
DIET	NPO	X LIQUID CLEAR	SOFT	REGULAR	SPECIAL	PROGRESS TO
SPECIAL INSTRUCTIONS						REG. DIET AS TOLERATED

DATE	NURSING MEASURES
POST-SURGERY	<p>VITAL SIGNS+CVP PER REC.ROOM, THEN q4hX48 HRS., THEN q.i.d.</p> <p>ACCURATE INTAKE & OUTPUT FOR FIRST 48 HOURS</p> <p>LEG IN SUSPENSION</p> <p>ENCOURAGE COUGHING AND DEEP BREATHING + CALF EXERCISES WHILE AWAKE</p> <p>ELEVATE HEAD OF BED AD LIB IF VITAL SIGNS STABLE</p> <p>TURN PATIENT FROM SIDE TO SIDE AS COMFORT ALLOWS</p>

Figure 2.—Sample Postoperative Patient Care Plan.

of the most essential elements for a satisfactory post-operative course.

The surgeon may insert a satisfactory prosthesis but if the patient, with the help of his family and the health team is not *motivated* to do the necessary muscle exercises to move the joint, the operative procedure will not be successful.

Preoperative patient teaching should include:

a) An explanation of the operative procedure and its value to the patient. This is usually done initially by the doctor but it should be repeated and reinforced by the nurse.

b) A demonstration of the Balkan frame, trapeze, and balanced suspension traction, all of which should be fitted to the patient. Time should be allowed for the patient to use and become familiar with the equipment if his affected hip will permit such activity.

c) Instruction in the necessary leg and hip exercises that the patient will do postoperatively, along with proper crutch walking. This is usually initiated by the physiotherapy department and reinforced by the nursing staff. The exercises should be explained, demonstrated slowly, and repeated frequently for the patient so that he understands which muscles are being moved and the reason for the movement.

d) The purpose of frequent coughing and deep breathing postoperatively should be explained, with a

demonstration by the inhalation therapy department in the use of the IPPB equipment.

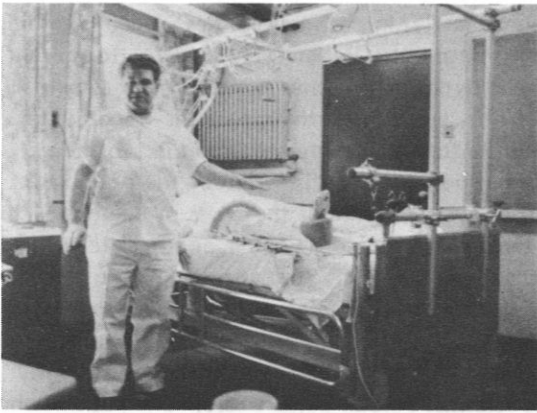
e) The value of a firm mattress, bed board, sheep skin (if a Lapidus air-flow mattress is not obtainable), and frequent turning to the operative side only, is related to keeping the body in good alignment, promoting skin integrity, and preventing dislocation of the hip, respectively.

f) The need for elastic stockings on both legs to support the veins and to prevent hemostasis is explained.

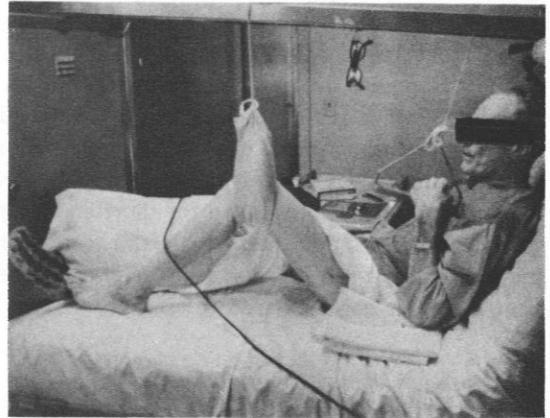
g) A visit to the intensive care unit (ICU) to see the area and meet the personnel will do much to allay fear and apprehension since all of these patients spend their first night postoperatively in this unit. The family, whenever possible, should also accompany the patient for a preoperative visit.

h) An explanation should be offered as to why such a large area of skin must be shaved preoperatively — from the involved hip to the toes, including the groin, from midline posteriorly to midline anteriorly. Help allay patient fears about the extent of the operative area. Briefly define the incision site and the purpose of it.

i) Endeavor to answer all the questions presented by the patient and family with honesty, and recheck at a later time to be sure that they understand



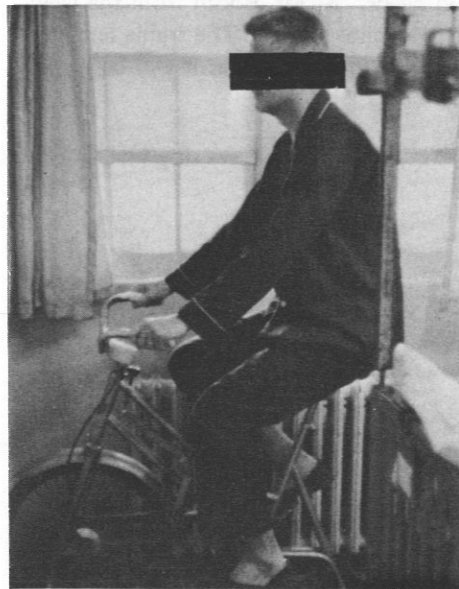
Chief Orthopedic Technician Booth (New England Baptist Hospital) explains key points in hip care.



Another patient, "free from pain" and able to direct his own exercises for strengthening muscles, takes his assignment seriously.



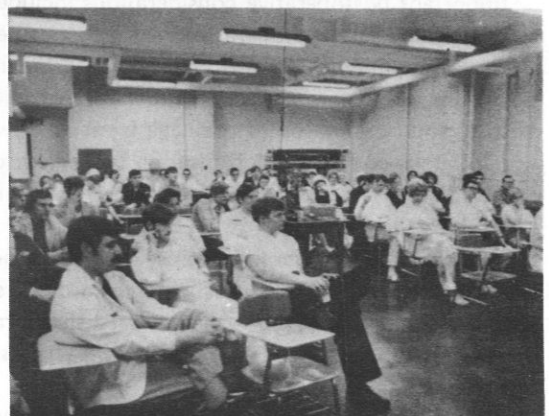
Under the direction of Nurse Instructor Fulton (New England Baptist Hospital), care and concern on the part of the health care team are emphasized.



A patient who reaches the "bike stage" is well on the way to recovery and goal fulfillment.



A patient demonstrates the importance of exercise and the use of the sling to elevate and lower the affected hip in preparation for crutch walking.



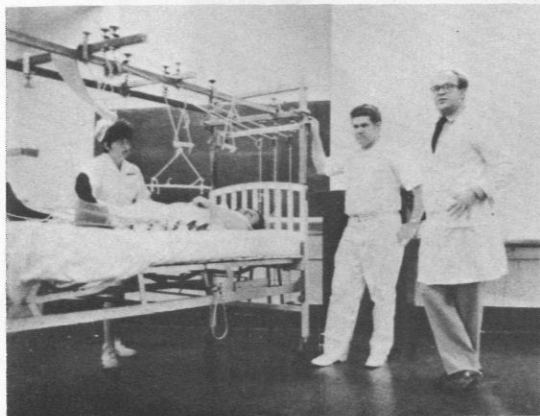
Participants in the group listen attentively.

your explanation. A well-informed patient is far more cooperative and capable of helping himself.

These represent only a few of the preoperative considerations which are so essential in preparing and supporting a hip replacement patient. Through an informative and effective patient interview, a proper patient assessment, and a realistic plan for short and long-term goals, important members of the health team such as the nursing staff can prepare, teach, and assist the patient along the complex road to recovery.

Postoperative Nursing Considerations.

The surgery itself lasts approximately three to five hours, after which time the patient is placed on his postoperative bed which has been specially designed for his comfort and needs. As Mr. Booth from the New England Baptist Hospital stated, "The frame and the bed must be fitted to the patient, as it will be his/her home for many weeks."



"Tailoring" the bed and frame to the size of the patient is done prior to surgery. Approach your patient with confidence.

Important postoperative considerations include:

a) Immediate postoperative management resembles that of any patient after major surgery and includes: vital signs, intravenous fluids, maintenance of patent airway, and observation of drainage from Hemovac.

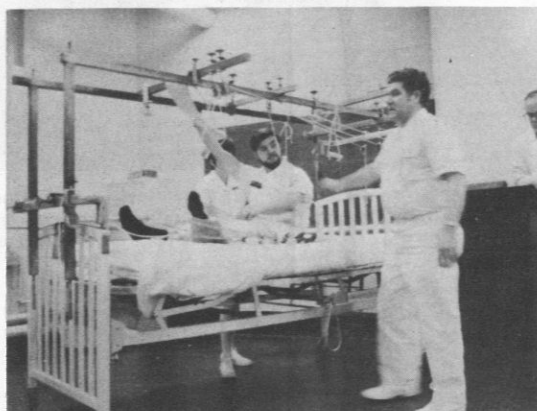
b) Balanced suspension traction is applied to the involved side. The repaired hip is placed in the most neutral position possible.

c) Position is generally supine, with the head slightly elevated, and usually turned toward the side of surgery; the head may be turned toward the normal side by *only* 30 degrees. The doctor will write specific positioning instructions.

d) Exercises. Simple dorsi-plantar flexion and toe curling exercises with quadriceps setting are begun al-

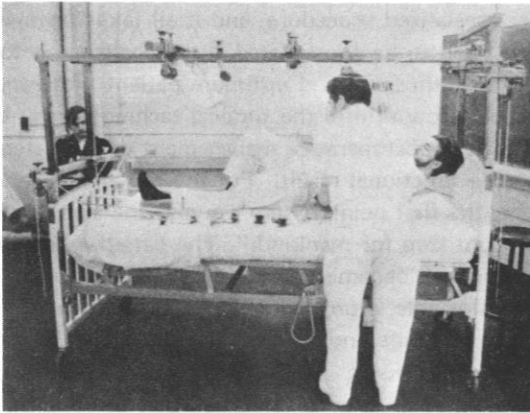
most immediately, in both extremities. Deep breathing and coughing are also initiated immediately to prevent pulmonary hypostasis. Other exercises such as pelvis lifts and tilts, pull ups by the use of the trapeze, and touching the toes are progressed according to the patient's condition and the discretion of the physician. The nurse must be aware of the types of exercise which the patient should be doing, appropriately reinforcing and encouraging. Strengthening of muscles is what mobilizes the new joint and the physiotherapy department can not remain on the ward 24 hours per day; the nursing staff must accept their responsibility for this essential part of patient care. The patient who performs his exercises faithfully will be the one who makes the best recovery. Encourage and reassure him that it is not the hip that usually causes discomfort but the surgical effects and incision which are temporary. Dr. Shea remarked that the patient with an uncomplicated hip replacement should not require narcotics after the first postoperative day. A *confident* and *capable* staff, who assist the patient to properly exercise his extremity, remove much of the anxiety experienced by the patient during the first postoperative days.

e) Instruct the patient in the use of the contralateral leg and overhead handles to lift and help himself. Encourage independence early in the postoperative period.



Teaching the patient to sit up and to use the hand grips and bars for positioning is most important. Patients should be able to touch their toes in five days.

f) Lifting the patient onto the bedpan (fracture pan) should be demonstrated and practiced preoperatively, using two people. One individual supports the surgically repaired hip with one hand under the sacrum and the other under the posterior thigh, while the second person slips the bedpan under the patient. The patient can help to lift himself up with overhead hand straps. Back care and linen change can be accomplished



Buttocks are placed in the middle of the bed. This helps prevent backache and pain.

in the same manner. Unless otherwise ordered by the physician, the surgically repaired hip should be supported in this fashion for maneuvers required during the first postoperative week, or more.

g) Alignment.

1) Keep the patient in the middle of the bed and in proper alignment, with the involved leg in abduction.

2) Place the bedside table on the side of the involved leg to prevent the patient from causing dislocation by turning away from the hip.

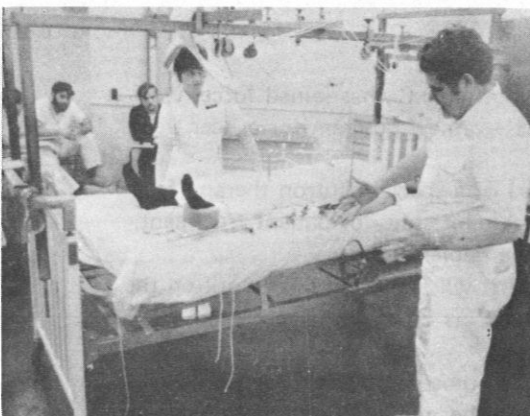
h) Prevention of complications.

1) Good back and buttocks care is given every four hours while the patient is in suspension.

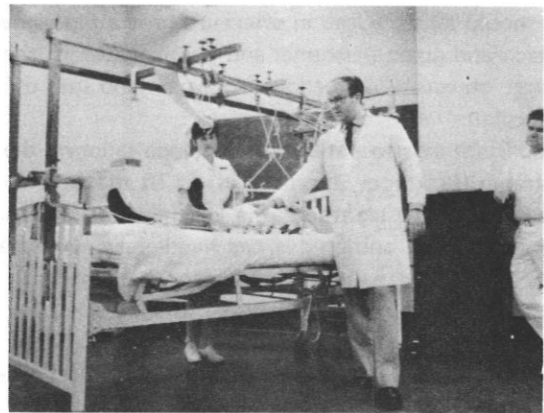
2) Report any numbness of the foot or any loss of dorsiflexion (foot drop).

3) Prevent peroneal palsy. Do not allow any pressure to be applied along the outer aspect of the lower thigh, knee, or upper calf.

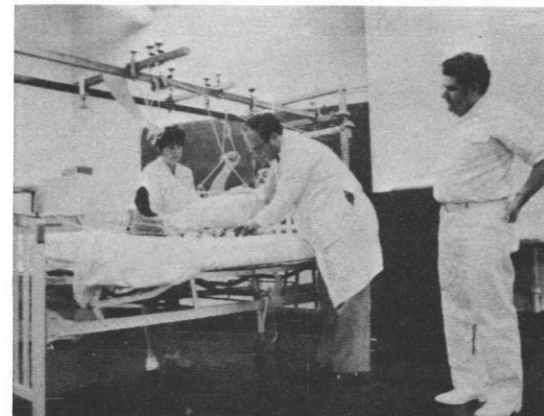
4) Report any signs of poor circulation, excessive bleeding, or severe pain in the involved extremity.



"Patient is placed on the bed— not into the bed."



Rehabilitation starts the first morning with the wiggling of toes.



Dr. Shea demonstrates "hip support" and "positioning" so vital in hip care. By feeling the hip the physician decides on the prudence of dangling.

5) Watch for any signs of hemorrhage, pulmonary embolus, thrombophlebitis, and dislocation of the prosthesis since these are the most common postoperative complications.

CAPT deWaal commented that the team approach is essential in the rehabilitation of the hip replacement patient. Surgery is only the first step in the long process of recovery. The real measure of success in rehabilitation rests with the *motivation* of the patient and the *dedication* of the health care team.

CONCLUSION

Success in hip replacement is largely dependent on patient motivation and staff expertise. "If you are fearful and afraid because you do not know what you are doing, keep away from the patient," physicians advised. This admonition convinced the authors that

they should take the lead in offering a program designed to teach and guide personnel and patients toward the ultimate objective of freedom from pain and ease of locomotion.

Important aids to patient care include tailoring the bed frame (Balkan or Zimmerman) to fit the patient, use of Harris-type leg traction, a leg splint, a Lapidus air-flow mattress, and an overbed hand-grasping frame which enables the patient to move about. Since the hospital stay may range from three to six weeks, the patient's bed becomes his home, so to speak, and should be tailored to the size, comfort, and total welfare of the inhabitant. Exercises begin with simple wiggling of the toes. Active progression of exercise follows throughout the rehabilitation period, from riding a bicycle, to walking with crutches, and finally to walking with, or without, a cane.



Physical Therapist, J. Stearns (center), demonstrates the principle of crutch-walking.

Planning, teaching, and rehabilitation are the essential components of the support that is required for this

highly specialized procedure, and it all takes teamwork. Efforts need to be coordinated if the challenge is to be met with enthusiasm and optimum patient motivation. No matter how skillful the surgical technique may be, it is still the postoperative management which determines the functional result. For the hip arthroplasty patient, the first painless step assumes the significance of "a giant step for mankind." The patient who once was 63 in. tall becomes 74 in. high; he stands erect and comfortable, a productive member of society, ready to meet life and its challenge.

ACKNOWLEDGMENT

The authors wish to acknowledge the guidance and assistance provided in this endeavor by: CAPT Jan G. deWaal, MC, USN; LCDR William D. Shea, MC, USN; Mr. Booth, LPN, Chief Orthopedic Technician, New England Baptist Hospital; Mrs. Fulton, RN, New England Baptist Hospital; and photographer HN Robert Curtis, USN.

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FAST NEUTRON BEAMS

The Naval Research Laboratory (NRL) in Washington, D.C., has joined forces with university scientists in a major cancer research effort — a new program for cancer treatment using fast neutron beams.

Plans call for the completion (in about one year) of a special neutron therapy facility at NRL employing the Laboratory's cyclotron. A pilot study of patient treatment, similar to a project now underway in London, will be implemented.

Until the therapy unit is completed, NRL scientists will continue their work on the physical characteristics of the neutron beam and its effects on biological subjects, including human cells.

It is now thought that fast neutron beams, such as those produced by NRL's cyclotron, may be effective in treating local tumors where other radiation therapy has failed.

—CHINFO NEWSGRAM (49-72). ☛

THE GASTROENTEROLOGISTS' CORNER

PARASITOLOGY for the GASTROENTEROLOGIST

By CDR James J. Cerda, MC, USNR-R

To paraphrase Dr. Elsdon Dew, the science of parasitology (largely through neglect) has remained the "Cinderella" of clinical sciences, and fecal protozoology has been its "ashes." Physicians whose experience in parasitology is limited to what they encounter in a comfortable urban or suburban practice find it difficult to realize the magnitude of the problem and the overwhelming impact of parasitic disease upon human health in parts of the world where the population is

heavily infested. As a result of our unfamiliarity with the problem, we are often unprepared to recognize the presence of parasitic infection when it is brought to our doorstep. What to some might seem a vague, transient illness, or perhaps an attack of traveler's diarrhea might be identified by a more experienced observer as an acute attack of giardiasis. A mild intermittent diarrhea with occasional abdominal cramps or epigastric pain, which might be labeled psychoneurosis, functional

THE AUTHOR

CDR James J. Cerda, MC, USNR-R is Associate Professor of Medicine in the Division of Gastroenterology at the University of Florida College of Medicine in Gainesville, Fla. Previously, CDR Cerda was Chief of Gastroenterology, University of Pennsylvania Medical Division at the Veterans Administration Hospital, Philadelphia, Pa., and Assistant Professor of Medicine at the University of Pennsylvania School of Medicine.

Dr. Cerda served on active duty from 1951 to 1954 aboard the USS STEINAKER (DD-863), the USS R.L. WILSON (DDE-847), and on the Staff of Commander Escort Destroyer Division 42. As a member of the

Medical Corps Reserve, Dr. Cerda has held numerous billets aboard East Coast-based NRT destroyers and is currently assigned to the USS WALDRON (DD-699) in Mayport, Fla. He also serves as the Commandant's Local Representative for Medical Affairs at the University of Florida College of Medicine.

CDR Cerda's major fields of interest have been in intestinal digestion and absorption, parasitology, nutrition and liver disease. The present paper was prepared by the author during a recent tour of active duty in the Gastroenterology Unit, Naval Hospital Philadelphia, Pa.

gastrointestinal disturbance, or possible treatment-resistant duodenal ulcer, may actually be the result of hookworm infestation.

Far from declining in importance, intestinal parasitosis has grown to become a considerable problem in the United States as a result of the crowding in our slums, aggravated by waves of migration of large numbers of people from other countries, especially areas where parasitism is common. Our involvement in Vietnam has brought the problem even closer to home. The incidence of diarrheas, dysenteric infection, and malaria considerably outranks that of battle injuries in American troops. Intestinal parasites found among U.S. soldiers in Vietnam have included *Entamoeba histolytica*, *Giardia lamblia*, hookworm, *Ascaris lumbricoides* and *Strongyloides stercoralis*. Our experience in Vietnam is far from unique. Casualties resulting from parasitic infection have actually affected the outcome of many important historical campaigns, including the ill-fated Allied adventure in Gallipoli in World War I, the campaign of Napoleon against Russia, and the German attack on Russia in World War II.

This review is not meant to be all inclusive. Attention will be directed to a consideration of certain aspects of some parasites commonly encountered in a gastroenterologic practice in the United States.

Clinical Diagnosis of Intestinal Parasitism

Success in diagnosis depends primarily on technical accuracy and physician awareness of the many approaches available to substantiate a "high index of suspicion," the single most important factor which will insure diagnostic accuracy. Table I lists the most important measures that are generally available to substantiate the clinical impression.

Examination of the Stool.

In most hospitals routine examination of the stool yields a rather poor return. It is important that several fresh stools be examined by experienced personnel. If

it is not feasible to examine fresh specimens, it may be satisfactory to hold samples of stools for subsequent study through the use of proper preservatives. A stool sample mixed with polyvinyl alcohol can be examined at leisure for trophozoites and a sample mixed with formalin will be satisfactory for later examination for cysts. It is sometimes helpful to purge patients with buffered phosphosoda. The first and second post-purge specimens may yield larger numbers of organisms. Moreover, one should be aware that a number of anti-diarrheal preparations, enemas, laxatives, antacids, anti-infective agents, and barium sulfate will substantially decrease the possibility of making an accurate diagnosis.

Examination of Enteric Contents.

Intubation of the small intestine is easily accomplished with a Rehfuess tube. Examination of small intestinal contents obtained in this manner is the most accurate method of diagnosing *Giardia lamblia* and *Strongyloides*. The study should be part of every biliary or pancreatic drainage procedure. A recent innovation for sampling duodenal contents involves the oral passage of a small retrievable capsule with subsequent examination of the mucus clinging to it.⁷

Small Intestinal Biopsy.

The small intestinal biopsy has proven to be of inestimable value in detecting parasites located in close association with the brush border or actually invading the small intestinal mucosa. Parasites such as *Giardia lamblia* (See Figure 1), *Capillaria philippinensis*, *Strongyloides stercoralis*, and coccidia may be revealed. Furthermore, a sufficient quantity of enteric contents are available in the biopsy tube for microscopic examination.

Sigmoidoscopy.

Sigmoidoscopy should be a part of the routine work-up. With the scope in place, a pipette with a bulb syringe can be introduced to obtain a small amount of fluid directly from the surface of the mucosa.

Rectal Biopsy.

Biopsy of rectal tissue should be performed even if the mucosa appears normal on inspection. Fresh rectal tissue can be examined for *Schistosoma* eggs if one crushes the small fragment between two glass slides and examines the unstained material under the microscope.

Liver Biopsy.

Liver biopsy is an excellent complementary method for confirming the diagnosis of schistosomiasis, especially when employed in conjunction with rectal biopsy.

TABLE I

PROCEDURES HELPFUL IN ESTABLISHING A DIAGNOSIS OF INTESTINAL PARASITISM

1. Frequent and accurate stool examinations
2. Fresh examination of enteric contents
3. Endoscopy and biopsy
4. Special stains
5. Serologic tests
6. X-ray studies and photoscanning

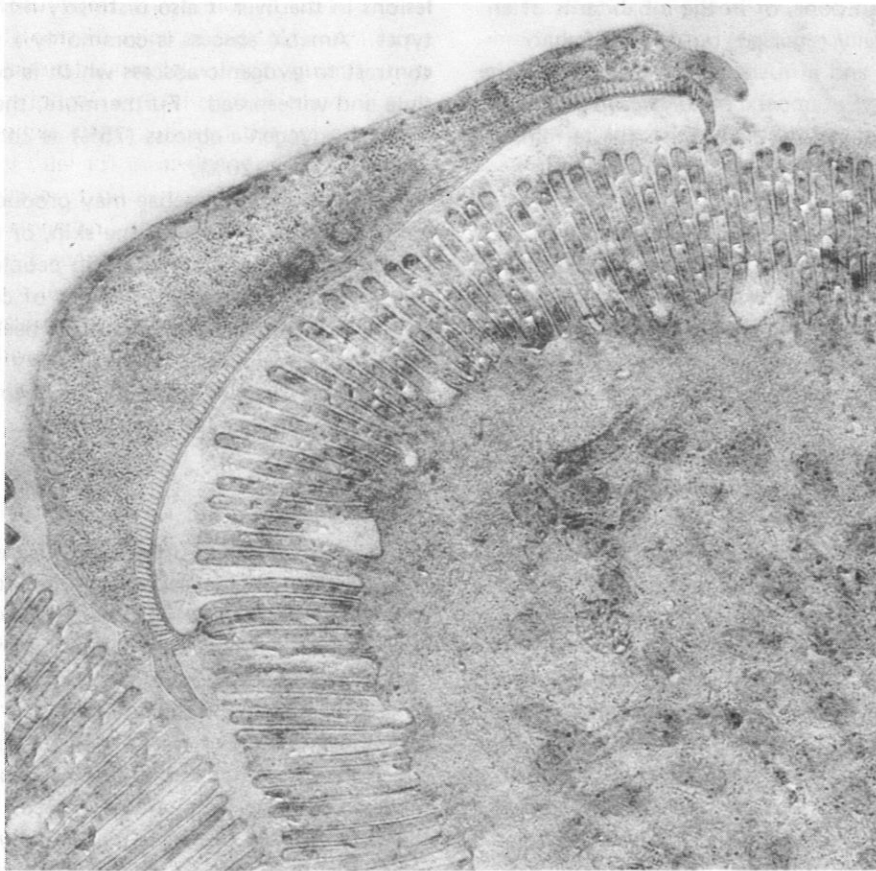


Figure 1.—ELECTRON MICROSCOPIC VIEW — The value of small intestinal biopsy in the diagnosis of enteric parasitism is exemplified by the electron microscopical view of a Giardia organism adjacent to the brush border of the duodenum.

Schistosoma eggs may be detected readily in the small fragment of fresh liver tissue crushed between two glass slides and examined directly. This method may be more successful in establishing the diagnosis than routine preparation of the same material for histologic study, unless serial sections are made.

Special Stains.

Certain special stains of tissue are helpful in further defining the histologic problem. These include iron hematoxylin for Amoebea, trichrome and Giemsa stain for Giardia, and acid-fast stain for Schistosoma ova.

Serologic Testing.

The use of serologic techniques in the diagnosis of parasitic infections is rapidly gaining wide popularity. It is particularly helpful in the diagnosis of amebic liver abscess. It should become useful as well in epidemiologic studies. The most sensitive tests at present seem to be the indirect hemagglutination, complement fixation, and gel diffusion.

X-ray and Photoscan Studies.

X-ray studies are helpful in a number of instances, particularly the small bowel series for nematodes and cestodes. Photoscanning is employed largely for confirming the diagnosis of amebic abscess. A lateral as well as an anteroposterior view is extremely helpful in demonstrating the abscess in its most common location — the lateral portion of the right lobe of the liver.

Other Tests.

Other studies such as hematologic evaluation (except for malaria) and liver function studies are helpful in the total evaluation of the patient but do not add substantially to the diagnosis.

Protozoan Infections

Amebiasis.

Most physicians appreciate the fact that amebiasis may exist among urban dwellers who have never left the country. Entamoeba histolytica has been found

not only in the urban poor, or in the inhabitants of an institution for mentally retarded, but even in inhabitants of fashionable and affluent neighborhoods. In the gastrointestinal tract *Entamoeba histolytica* is of most importance in the colon (amebic colitis), the terminal small intestine (ameboma) and in the liver (hepatic amebiasis).

The symptoms of amebic colitis usually resemble those of acute or chronic dysentery. In some instances the disorder may simulate ulcerative colitis. In other cases the symptoms are much milder and the condition may even be labeled as spastic colon with the patient complaining of crampy abdominal pain, rarely severe, and constipation.

When the disease affects the ileocecal region the X-ray picture, which may be quite characteristic, shows a tapering barium column with characteristic irregularity affecting the ileocecal region, corresponding to the presence of a massive granulomatous response to amebic infection (ameboma). In some cases this may mimic a carcinoma.

If amebae enter the portal circulation they invade the liver (hepatic amebiasis). The resultant abscess is usually confined to the liver but occasionally extends into the subphrenic space, even rupturing eventually into the lung. A common symptom in amebic abscess of the liver is referred pain, most often into the abdomen but occasionally to the chest, shoulder, back or right flank. Fever is often present along with other systemic symptoms such as weakness, chills, weight loss, nausea, and vomiting. Cough occurs in about one-third and diarrhea in about one-fourth of the patients. It must be emphasized that the diagnosis of amebic abscess often presents a baffling problem clinically. The condition may mimic chest disease or an acute abdominal disorder, fever of unknown etiology, malignancy, or even pyelonephritis. Although in many cases it may suggest liver disease, liver function studies are frequently normal. As previously mentioned, the diagnosis of amebic abscess has been remarkably facilitated by the use of liver photoscanning and serodiagnosis. The major differential lies between hepatic abscess caused by the amebae or pyogenic abscess of the liver. Amebic abscess is most often associated with right upper quadrant pain, diarrhea, especially bloody diarrhea, elevation of the diaphragm, an increase in the white blood cell count, elevation of the serum alkaline phosphatase and little or no elevation of bilirubin. On the other hand, pyogenic abscess is less commonly associated with right upper quadrant pain or diarrhea and almost never with bloody diarrhea. The diaphragm is rarely elevated in pyogenic abscess, and bilirubin levels are more likely to be increased. The number of

lesions in the liver is also distinctly different in the two types. Amebic abscess is commonly a solitary lesion in contrast to pyogenic abscess which is commonly multiple and widespread. Furthermore, the mortality is far higher in pyogenic abscess (75%) as contrasted with amebic abscess (20%).

In rare instances amebae may produce peritonitis, pericarditis, ulcerations of the skin, or may infect the urogenital system, particularly in people who practice poor hygiene. Recently a number of cases of brain abscess and meningoencephalitis have been shown to be caused by certain amebae, particularly the free-swimming variety such as are found in stagnant pools and ponds. They enter the central nervous system probably through the nasal passages.

Giardiasis.

Giardia lamblia has often been dismissed in the past as a harmless commensal parasite of the intestines devoid of pathologic significance. However, it has now been well established that giardiasis may cause significant gastrointestinal disease although its virulence varies greatly with the individual host. It is a relatively common infection of travelers to foreign countries and a high incidence of the condition has been found in soldiers returning from Vietnam. It is frequently associated with other disorders, particularly other enteric infections, malnutrition, and in the postgastrectomy patient. Of recent interest has been the high incidence of *Giardia lamblia* infestation found in subjects with immunoglobulin deficiency syndromes, particularly IgA deficiency with, or without, nodular lymphoid hyperplasia of the small intestine. In such cases one may be alerted by the finding of diarrhea in a patient who has been subject to repeated respiratory tract infections.

The most common symptom is diarrhea. Epigastric pain may be present and may simulate that of peptic ulcer disease. Much less commonly the patient may complain of nausea and vomiting, weight loss, fever, chills, fatigue and heartburn. In a few cases the picture has been that of cholangitis, including the presence of jaundice. It remains to be established if *Giardia* are a significant cause of gallbladder disease. Although the parasite can cause significant malabsorption, steatorrhea accompanying giardiasis occurs in less than one-half of the patients.

Malaria.

Diarrhea and abdominal pain are not uncommon in malaria, especially in cases of infection with *Plasmodium falciparum*. Nausea, vomiting and hematemesis may occur. Occasionally the patients may have

bloody stools or may develop ileus. Consequently all patients with malaria should be screened carefully for an associated intestinal parasitic infestation. During the early phase of the disease the liver is enlarged and tender. A percutaneous biopsy may show large amounts of malarial pigment in the cytoplasm of hepatic cells. This can be differentiated from lipochrome and other pigments by means of polarized light. Involvement of the liver in falciparum malaria may simulate viral hepatitis. The histologic changes are not unlike those of virus infection including the presence of lymphocytic deposits in the portal fields and, occasionally, evidence of cholestasis.

Helminthic Infections.

The nematodes *Ascaris lumbricoides*, hookworm and *Strongyloides* commonly present with a similar constellation of symptoms, primarily vague abdominal distress, localized epigastric pain, and occasionally colic and intermittent diarrhea. In some patients, especially patients heavily infested with *Ascaris*, a ball of worms may form and produce intestinal obstruction. This syndrome is well known in the tropics where it is the first diagnostic consideration in the minds of many clinicians, before they consider the possibility of a surgical lesion of the bowel. Eosinophilia, usually between 10 and 15% is common in these disorders. Iron deficiency anemia may be quite profound in hookworm infection and each worm is capable of consuming 0.1 to 0.2 ml of blood per day. Other symptoms of hookworm infection include "ground itch" which develops when the larvae enter through the skin of the sole of the foot. One to two weeks later the patient may have pulmonary symptoms ("fox-hole cough"), corresponding to the pulmonary phase of larval migration. Subsequently anemia appears and the serum iron may become quite low. A gastric biopsy may show atrophy of the mucosa. Infection with *Strongyloides* may be somewhat more virulent. Abnormalities of the small intestine can be shown by X-ray studies in the form of rigidity and narrowing of the duodenum and jejunum, representing the mucosal inflammation. Larval invasion can occur at all levels in the gastrointestinal tract. Fatal infections with *Strongyloides* have been reported in patients receiving corticosteroid therapy.

Schistosomiasis.

Schistosomiasis is truly the world's leading problem. In Africa alone 150 million people suffer from schistosomiasis. The economic loss is staggering because of the retarding effect of this type of parasitosis on projects designed to improve living conditions, especially

irrigation and agricultural projects. Furthermore, the infection can also involve horses and cattle. The cattle losses caused by schistosomiasis in Africa are enormous. In this country schistosomiasis is seen largely in people who migrate from Puerto Rico and other parts of Central and South America, especially from the rural districts. Schistosomiasis rarely presents as the classic textbook description of an emaciated patient with a potbelly caused by ascites. Instead, the clinical picture at an advanced stage is usually that of portal hypertension with recurrent hematemesis from esophageal varices. The infection is often mild and the clinical course may last from 20 to 30 years. When ascites is present the likelihood is strong that the patient is suffering from nutritional cirrhosis as well. The earliest liver lesions are nonspecific hepatic granulomata. With long-standing disease periportal fibrosis is seen, which is commonly referred to as "pipe stem" fibrosis. All the schistosomes produce the same type of hepatic fibrosis. It is important to note that the bromsulphalein test is usually normal and jaundice occurs infrequently. The serum albumin is usually normal and there are no signs of hepatic disorder such as spider angiomas and palmar erythema. Bleeding, when it occurs, is usually of short duration and limited in severity. These patients usually do poorly when one attempts to relieve portal hypertension by surgical means. Severe derangement of liver function occurs after shunt and hepatic encephalopathy may be profound.

Therapy in Parasitic Diseases

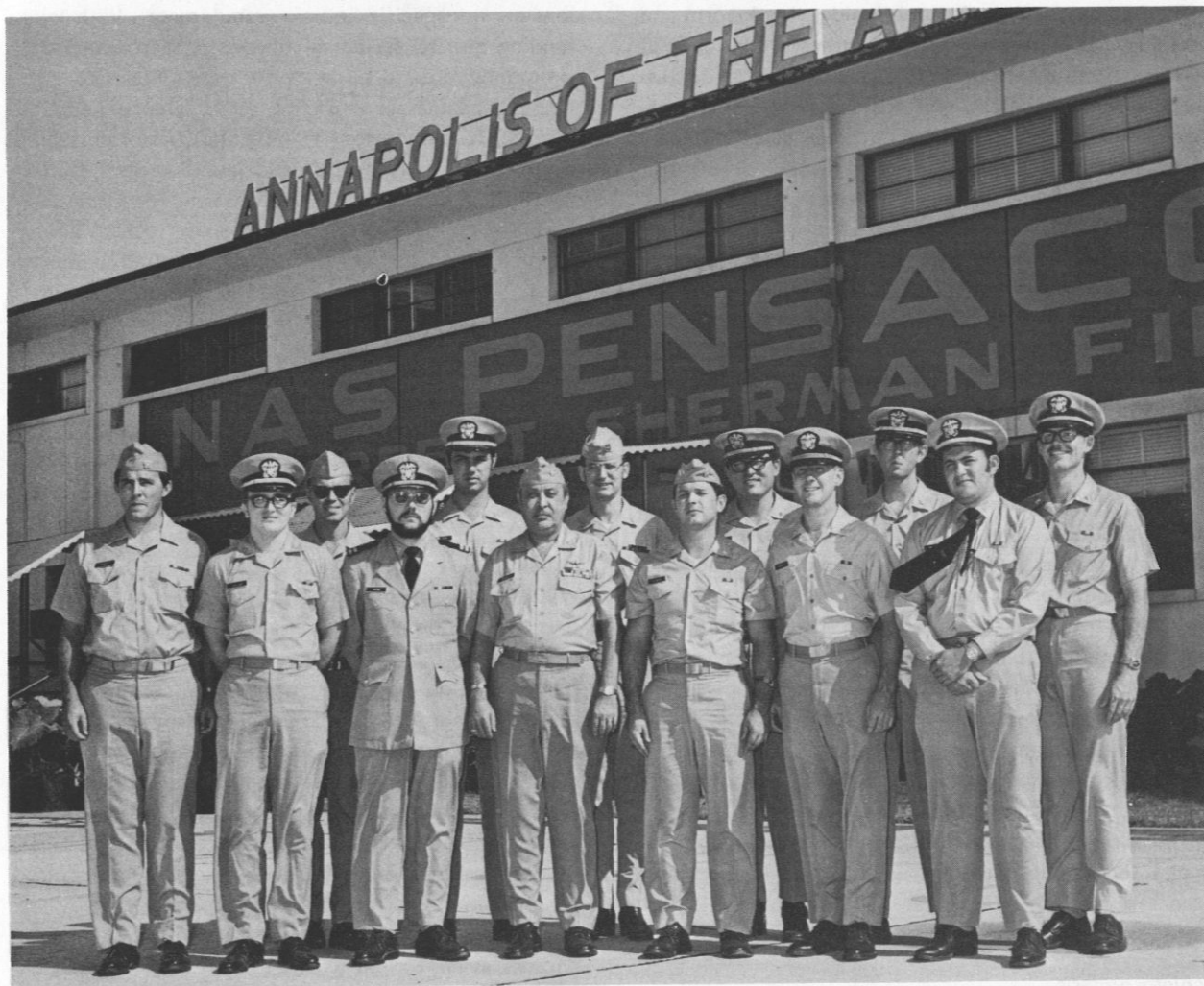
If a reliable diagnosis of parasitic infestation can be established, one must then decide if the infestation is significant enough to be responsible for the symptom complex. One must also consider the relationship of the parasitic infestation to concomitant disease and to the epidemiologic importance of therapy. Most anti-helminthic agents produce their chemotherapeutic effect either by interfering with mechanisms essential for the motor activity of the parasite, or by inhibiting biochemical mechanisms supplying the energy required for the functional integrity of the parasite. They are further characterized by their selective toxicity for the parasite as contrasted with a lower host toxicity.

It is not the purpose of this article to review the many compounds now available for use. However, there have been notable advances in the treatment of helminthic diseases (see references 4 and 5), and the reader is directed to those excellent reviews as a guide in treatment.

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4. Drugs for parasitic infections. *Med Lett Drugs Ther* 11 (6), issue 266:21-28, March 21, 1969 (Reprinted in *U.S. Navy Medical News Letter* 54:16-25, Oct 1969).
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FAMILY PRACTICE PHYSICIANS VISIT PENSACOLA



CAPT Robert C. McDonough, MC, USN (fourth from the left in front row), Commanding Officer, Naval Aerospace Medical Institute, posed for a group photo before Jacksonville Naval Hospital family practice physicians departed, after visiting Pensacola for aviation orientation on 27 Oct 1972. LT Mark Olson, MC, USN (far right) plans to return to Pensacola for the Institute's six-month student flight surgeon course.—PAO, Naval Aerospace and Regional Medical Center, Pensacola, Fla. 🍀

Bio-Electronic Determination of Endodontic Working Lengths*

By LCDR Milton R. Felger, DC, USN,
Dental Department, U.S. Naval Academy,
Annapolis, Maryland.

INTRODUCTION

Locating the apical foramen is essential for determination of the endodontic working length. This length must be known if instrumentation is to be properly controlled during biomechanical preparation and filling of the root canal. It is often difficult, if not impossible, to accurately locate the foramen by present roentgenographic methods, because of numerous technical problems and inherent deficiencies of roentgenography.

Inherent roentgenographic errors stem from the faulty assumption that the anatomical apex and anatomical apical foramen are coincidental. The error is further magnified when the roentgenographic image of the apex is interpreted as the anatomical apex in the

calculation of root canal length. This error can be considerable when the curvature of the apical one-third of the root is perpendicular to the X-ray film and parallel to the roentgen rays.

Tagge and Crowell¹ stated that it is clinically difficult to produce dental roentgenograms free from dimensional distortion. They confirmed that variation of such factors as object-film distance, and object or film angulation, can result in a lineal image distortion. Other deficiencies that contribute to error in reading dental X-ray studies are indistinct apical outlines and overlapping of roentgenopaque structures.

Technical difficulties in obtaining quality X-ray studies include faulty exposure and processing, contamination of the sterile field, and lengthy procedure time. The high expense of equipment and supplies, and radiation hazards, are additional problems encountered with the roentgenographic method.

A more precise, reliable, and rapid means of ascertaining root canal lengths is needed to replace the roentgenographic method presently used in clinical endodontics. An entirely new method of measuring root canal lengths by applying the principles of bio-electronics was first reported by Sunada.² He determined that electrical tissue resistance between the oral

*LCDR Felger performed this study under Bureau of Medicine and Surgery Work Unit MR005.20-6052, in partial fulfillment of the requirements for the Graduate Course in General Dentistry at the Naval Graduate Dental School, NNMC, Bethesda, Md., during the academic year 1971-1972.

The opinions or assertions contained herein are those of the author and are not to be construed as official or representing the views of the Navy Department or the naval service at large. The use of commercially available products cited does not imply endorsement of these products or preference over other similar products on the market.

mucosa and the apices of teeth was constant at approximately 6.5 kilohms. However, further evaluation of Sunada's method by Bocskay et al., showed variations in impedance value between the oral mucosa and the tip of an electrode positioned at the roentgenographic apex.³

In another study, Inoue reported a constant, low-frequency oscillation when the tip of a needle electrode was placed at the roentgenographic apex.⁴ He claimed satisfactory results in measuring root canals of 70 teeth, and suggested that the device he had invented was reliable for use in clinical practice.

Previous studies applying bio-electronic technology were not completely controlled with respect to accurately locating the position of the electrode tip relative to the anatomical apical foramen.

The purpose of this experiment was to evaluate a bio-electronic method of locating the anatomical apical foramina of human teeth by measuring tissue capacitance between the apical foramen and the oral mucosa *in vivo*.

MATERIALS AND METHODS

The apparatus used for measuring capacitance consisted of an electronic alternating-current impedance bridge,* set to measure relative capacitance in microfarads when oscillating at a 10 kilohertz frequency, with a one volt potential difference between electrodes. An endodontic file,** size 15, served as a positive electrode, and a 2 cm-in-diameter, aluminum-foil disk served as a negative electrode. Insulated lead wires were soldered separately to the electrodes to connect them to the impedance bridge.

Step I.

Clinical tests were conducted in two steps. In the first step, five patients undergoing root canal therapy of nine teeth were tested. All the teeth were single rooted, with one having a periapical radiolucency and another having a mechanical perforation through the pulpal floor. Approximate root canal lengths were ascertained by accepted roentgenographic methods.

To determine capacitance readings, the negative electrode was placed under the rubber dam, on mucosa adjacent to the submerged tooth root. The positive electrode was gradually inserted, through an opening in the crown, into a canal that had previously been

filled with saline solution. Capacitance readings were taken at five positions: -3, -2, and -1 mm short of the roentgenographically-determined apex; at the radiographic apex (0 mm); and 1 mm beyond the roentgenographically-determined apex. The mean for the group of teeth was calculated for each position.

Step II.

The second step was carried out to evaluate the accuracy with which apical foramina could be located by using the mean capacitance ascertained from Step I. The procedure was performed on two patients requiring extraction of a total of seven teeth. All teeth were without periapical radiolucencies and showed no clinical evidence of pulp disease. Crowns were isolated with a rubber dam, and partial pulp extirpation was completed under local infiltration anesthesia. The negative electrode was placed under the rubber dam on the oral mucosa, and the positive electrode (a size 15 file) was gradually inserted into the canal until a capacitance of .08 microfarads (mean value determined at roentgenographic apex in Step I) registered on the impedance bridge. A reference point was etched on the crown; the file was marked at that point, removed, and measured with a millimeter rule.

To determine actual length, the tooth was extracted and a file was inserted to the anatomical apical foramen. The file was marked at the reference point, removed, and measured with the rule. This direct measurement of canal length was compared with the bio-electronically determined length.

RESULTS

Mean capacitance values measured at the roentgenographic apex and at various distances from that apex are shown in Table 1. A mean capacitance reading of .08 microfarads was determined at the roentgenographic apex. None of the other values differed significantly*** from that value. A significant**** doubling in impedance occurred, however, when the positive electrode moved from 1 mm short of the roentgenographic apex to 1 mm beyond that apex.

Readings from two teeth were excluded from the mean capacitance computations because their values were well beyond the range of values for the other teeth. An extremely low capacitance of .0059 microfarads was observed in testing the tooth with a

*Capacitance Measuring Assembly Number 1620-A, General Radio Company, Concord, Massachusetts

**File, Pulp Canal, Dental Std.; Star Dental Mfg. Co., Philadelphia, Pennsylvania

***According to the student "t" test, P values less than .01 are considered to be significant.

****According to the student "t" test, P values less than .01 are considered to be significant.

Mean Capacitance (microfarads)	Distance from Apex (mm)	No. of Teeth
.05 ± .03	-3	5
.05 ± .03	-2	6
.05 ± .03	-1	7
.08 ± .03	0	7
.13 ± .04	+1	6

Table 1.—Mean Capacitance at Various Distances from Roentgenographic Apex of Root Canal

periapical radiolucency, and a capacitance of .20 microfarads was observed in testing the mechanically perforated tooth.

A comparison of root canal lengths as determined by the bio-electronic and direct measurement methods is shown for seven teeth in Table 2. Root canal lengths, as determined by the length of the inserted

Tooth number	Root canal lengths (mm)*		Errors (mm)††
	Bio-electronic measurement**	Direct measurement†	
1	20	20	0
2	21	22	1
3	20	20	0
4	23	23	0
5	24	24	0
6	25	25	0
7	23	23	0

Table 2.—Root Canal Lengths as Determined by Bio-Electronic and Direct Measurement Methods in Two Patients

*All measurements rounded off to nearest millimeter.

**Length from reference point on crown to point in apical portion of canal at which a capacitance of .08 microfarads was registered.

†Actual length measured after extraction.

††Difference between corresponding measurements.

file when .08 microfarads registered on the impedance bridge, are given in the first column. The actual lengths of the seven root canals, as measured by direct means after extraction, are given in the second column. The difference, if any, between these two lengths is shown as the "Error." In six out of seven teeth, the measurements obtained by the two methods were the same. A difference of 1 mm is seen for one tooth.

DISCUSSION

The mean capacitance of .08 microfarads between anatomical apical foramina and the oral mucosa obtained in Step I of the study was reproduced in six out of seven teeth in Step II. However, .08 microfarads may not represent a constant capacitance in all cases, as the sample tested was small and limited to teeth lacking clinical evidence of pulpal or periapical abnormalities.

Perhaps a more meaningful finding was the significant increase in capacitance that resulted as the electrode passed from 1 mm short of the roentgenographic apex to 1 mm beyond that apex. This upward trend may serve as a more reliable guide than the application of .08 microfarads in indicating apical foramina, because .08 microfarads had a high standard deviation. In this study, the following factors may have been responsible for the deviations: (1) Tissue capacitance may have varied among patients; (2) Placement of the electrode tip relative to the anatomical foramina was approximated, owing to errors inherent in roentgenographic measurements; (3) Saline injections may not have completely filled the canals and this would reduce current conductivity.

The imprecision of the millimeter rule for measuring files can introduce errors of ± .05 mm. A more precise measuring device, such as a vernier caliper, would reduce such error.

Further investigation, using a larger and more varied sample, may prove the bio-electronic method of locating apical foramina to be advantageous to the endodontist. This method may provide greater precision than has heretofore been possible. Greater precision would permit the endodontist to obtain more exact working distances for endodontic therapy and thus ensure greater success. Also, the time needed for therapy would be considerably reduced if roentgenographic procedures were eliminated. The instrument is economical and simple to use; with the low voltage potential, it is biologically safe; and the current is imperceptible to patients.⁵

SUMMARY

In summary, a bio-electronic method of locating anatomical apical foramina was investigated by measuring the tissue capacitance between the apical foramina and oral mucosa. In six out of seven teeth tested, root canal lengths determined by the bio-electronic method were identical to lengths determined by direct measurement. Perhaps more significant was the doubling of capacitance as the positive electrode passed from just within the canal to just beyond it.

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LCDR HAMMERSBERG AWARDED DFC

LCDR Jon Robert Hammersberg, MC, USN is one of those doctors who still makes house calls.

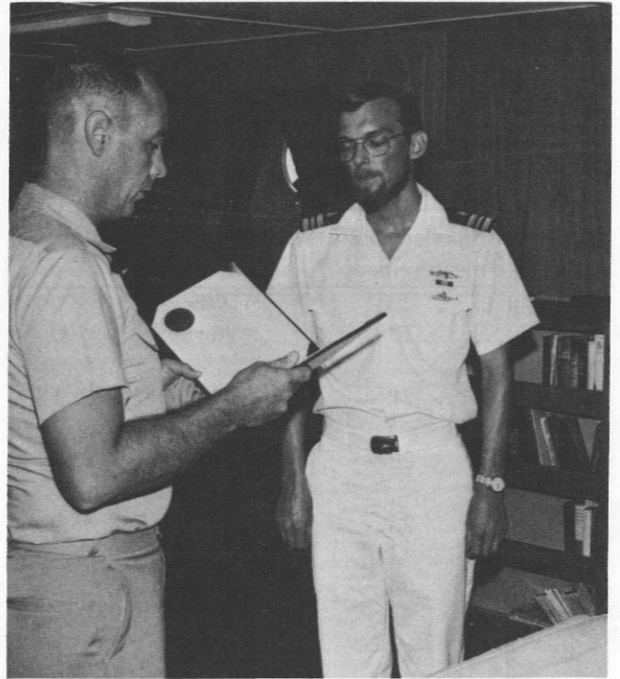
As a matter of fact, he'll willingly make a house call whenever the situation demands it, and the U.S. Coast Guard has recognized him for it. He has been awarded the Distinguished Flying Cross for braving extremely hazardous conditions to assist a critically-injured sailor aboard a submarine off the coast of Virginia, two years ago.

The seas were so rough and visibility so poor that the helicopter pilot couldn't even see the submarine. With radio guidance he tried to lower Dr. Hammersberg on board. Many attempts failed; on one occasion the guideline broke and the physician had to be hauled back on board the helicopter.

But LCDR Hammersberg was determined to get to his patient and was again lowered over the wildly-pitching submarine. After crashing into the side of the sub repeatedly, he finally made it, minus his doctor's bag which was lost to the ten-foot waves.

Once on board, LCDR Hammersberg succeeded in maintaining and supporting the patient until he could be transported to the hospital for surgery.

"For his remarkable skill, courage, faultless judgment and unwavering devotion to duty," in boarding a submarine under extremely hazardous conditions to administer medical aid to an injured seaman, LCDR Jon Robert Hammersberg was awarded the Distinguished Flying



CAPT D.P. Hall, USN, (left), Commanding Officer of Submarine Squadron Six where LCDR Hammersberg serves as the senior medical officer, reads the citation accompanying the Distinguished Flying Cross awarded the naval physician.

Cross by the U.S. Coast Guard.—(PAO, Commander Submarine Force, U.S. Atlantic Fleet, Norfolk, Va.) ☛

AFIP ZIP CHANGE

Effective 1 Jan 1973, the Armed Forces Institute of Pathology will be changing its zip code number to 20306 (vice 20305). Please note. ☛



AFEES CALL FOR RETIRED MILITARY PHYSICIANS

In the Sept 1972 issue of *U.S. NAVY MEDICINE* a brief announcement of a Dual Compensation Law waiver granted by the Civil Service Commission appeared on page 38. Active recruitment of retired military physicians to fill selected medical billets is now being implemented by a U.S. Army sponsoring program. Immediately available are positions at various Armed Forces Entrance and Examining Stations (AFEES), at the following locations: Boston, Mass.; New York, N.Y.; Charlotte, N.C.; Fort Jackson, S.C.; Cleveland, Ohio; Chicago, Ill.; Milwaukee, Wisc.; St. Louis, Mo.; Kansas City, Mo.; Dallas, Tex.; Houston, Tex.; New Orleans, La.; Oklahoma City, Okla.; Oakland, Calif.; and Seattle, Wash.

Any retired military physicians who might be interested in this type of employment are urged to contact: Mr. L.E. Segesman
Civilian Personnel Officer
Headquarters U.S. Army Recruit Command
Hampton, VA 23369.
Attn: USARC DP-C ☸

OTOLARYNGOLOGY BOARD

The American Board of Otolaryngology will hold its next certifying examination 26 Oct–2 Nov 1973 at the Palmer House in Chicago, Ill.

Eligible medical officers desiring to participate in the examination should submit their requests in accordance with BUMEDINST 1500.4 series to the

Bureau of Medicine and Surgery (BUMED), attention of Code 316.—Code 316, BUMED. ☸

NAVAL RESERVE ACDUTRA TRAVEL

A recent decision by the Judge Advocate General should be of vital interest to all Naval reservists before departing for ACDUTRA for periods of 30 days or less. The following information appeared in the Sept–Nov 1972 issue of *NERAGRAM*.

A Naval reservist who intends to travel to his ACDUTRA ship or station, or to return home with his own automobile or his own bus, plane or train ticket should realize that he is "covered" *only during the travel time allowed* by the Department of Defense Military Pay and Allowances Entitlement Manual (DODPM).

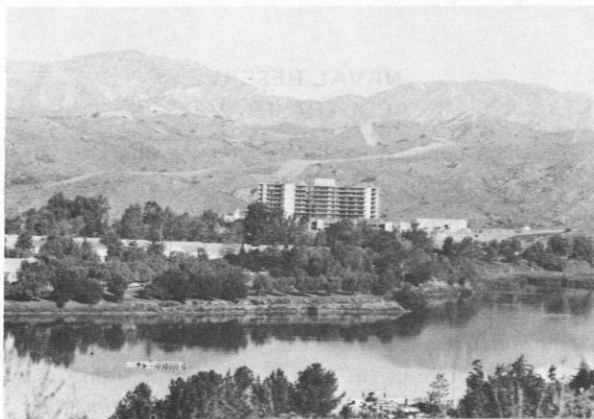
Allowed travel time to and from ACDUTRA ship or station is clearly defined by DODPM. If air transportation is reasonably available, travel time is computed on the basis of commercial airline schedules (not more than one day). If commercial air transportation is not reasonably available, travel time is computed on the basis of the most rapid surface transportation. A Naval reservist, however, is not expected to commence air or surface travel between 0000 and 0600 in order to meet schedules.

If, for example, a Naval reservist ordered to report to Newport, R.I. on 10 Sept from his home in Minneapolis departs in his own automobile on 8 Sept, he is not "covered" on 8 or 9 Sept. If he should be injured in an accident on those days, he would not be entitled to Navy hospitalization or pay while

hospitalized. If he should be killed on those days, his beneficiary would not be entitled to his Servicemen's Group Life Insurance benefits. (Note: The above is true even though your ACDUTRA orders authorize you to travel via privately-owned vehicle or by commercial air or surface transportation.)—Code 36A, BUMED. ☸

NEW HOSPITAL AT CAMP PENDLETON

The old wooden buildings originally constructed in 1944 at Naval Hospital Camp Pendleton, Calif., are rapidly being overshadowed by the magnificent new hospital under construction, which will boast 600 beds and the very latest in medical and surgical facilities.



NEW NAVAL HOSPITAL 65% COMPLETED—
With Lake O'Neill, the recreational area in the foreground and 3,000-ft. peaks behind the mountain capped by Case Springs resort in the background, a November view of the new Naval Hospital at Camp Pendleton is submitted by CAPT Fred Jackson, MC, USN. To the right of the new hospital, the new quarters for corpsmen can be seen also under construction.

We are indebted to CAPT Frederick E. Jackson, MC, USN, for a timely item and photo from the Naval Regional Medical Center and Naval Hospital, Camp Pendleton, Calif. ☸

MERITORIOUS UNIT COMMENDATION

The Secretary of the Navy has presented the MERITORIOUS UNIT COMMENDATION to the

Naval Hospital Philadelphia, Pa., for service as set forth in the following citation:

"For meritorious service from 1 January 1966 to 1 January 1971 in support of the United States Navy and Marine Corps Forces engaged in combat operations in Southeast Asia. Commencing in early 1966, the U.S. Naval Hospital, Philadelphia, Pennsylvania, as the designated East Coast Orthopedic, Neuro-psychiatric, and Ear, Nose, and Throat Center, rapidly expanded its support facilities to compensate for the ever-increasing influx of combat casualties. With only minimal initial increases in staff personnel, the hospital nonetheless succeeded in providing superb medical care and imaginative recreational programs and other services for the many thousands of patients admitted to its confines, contributing greatly to the achievement of an exceptionally high degree of morale. By their professional excellence, perseverance, cooperation, and dedication, the members of the hospital staff of the United States Naval Hospital, Philadelphia, Pennsylvania reflected great credit upon themselves, the medical profession, and the United States Naval Service." ☸

ANNUAL ANESTHESIOLOGY SYMPOSIUM

More than 300 physicians and other interested medical personnel attended the recent Third Annual Anesthesiology Symposium at the Naval Hospital, Portsmouth, Va. The two-day session was part of the Navy Bureau of Medicine and Surgery's continuing educational program for the benefit of both the military and civilian medical communities.

The program consisted of 14 guest speakers who also participated in panel discussions. The Symposium banquet featured an address by Robert Alderdice, Deputy Director of Flower Garden Ocean Research Center, The Marine Biomedical Institute, University of Texas Medical Branch at Galveston, who spoke on "Man In the Sea - 1995."

Speakers and topics during the first day were: Frank Moya, M.D., Professor and Chairman, Department of Anesthesia, University of Miami School of Medicine, who spoke on "History of Obstetrical Anesthesia"; Richard W. Stander, M.D., Professor of Obstetrics and Gynecology, University of Cincinnati School of Medicine, who spoke on "Fetal Physiology"; Frederick W. Hehre, M.D., Associate Professor in Anesthesia, Yale University School of Medicine, who spoke on "Anesthesia for Obstetrical Patients";

Burton S. Epstein, M.D., Professor in Anesthesia, George Washington University Medical Center, who spoke on "Anesthesia for Complicated Obstetrics"; Russell C. Raphaely, M.D., Medical Director of the Department of Inhalation Therapy, The Children's Hospital, Philadelphia, Pa., who spoke on "Respiratory Problems of the Neonate"; Benjamin G. Covino, M.D., Vice-President, Scientific Affairs, Astra-Pharmaceutical Products, Inc., who spoke on "Metabolism of Local Anesthetics"; and LTCOL Robert Kirby, MC, USAF, Chief, Anesthesiology, Keesler Air Force Base, who spoke on "The Pathophysiology of Shock."

Second-day speakers and topics were: Lawrence J. Saidman, M.D., Associate Professor of Anesthesiology, University of Miami, who spoke on "Uptake and Distribution of Anesthetic Agents"; E. Patrick Juras, M.D., Staff Anesthesiologist, St. Joseph's Mercy Hospital, Pontiac, Mich., who spoke on "Recent Developments in Muscle Relaxants"; John D. Michenfelder, M.D., Head, St. Mary's Section of Clinical Anesthesia, Mayo Clinic, who spoke on "Special Techniques in Neurosurgical Anesthesia"; Walter C. Bernards, M.D., Staff Anesthesiologist, St. Vincent's Hospital, Portland, Oreg., who spoke on "Acid Base Made Easy"; N. W. B. Craythorne, M.D., Professor and Chairman, Department of Anesthesiology, University of Cincinnati Medical School, who spoke on "Pharmacology of Balanced Anesthesia"; C. R. Stephen, M.D., Professor and Chairman, Washington University School of Medicine, who spoke on "Consideration of Halogenated Anesthetic Agents"; and CDR C. Robert Valeri, MC, USN, Officer-in-Charge, Naval Blood Research Laboratory, Boston Naval Hospital, who spoke on "Oxygen Transport."

Plans are now being formulated for next year's symposium which will be held 6-8 Sept 1973.—PAO, NRMCM, Portsmouth, Va. ☛

NRMCM LAB REACCREDITED

The Naval Regional Medical Center (NRMCM) Laboratory located at the Naval Hospital, Portsmouth, Va., has been awarded a certificate of reaccreditation by the American College of Pathologists. CAPT Nicholas D'Amato, MC, USN is Chief of the Regional Laboratory Service.

President W. J. Reals, M.D., of the College said that the laboratory has received its second three-year certification by the College's Commission on Inspection and Accreditation. The laboratory successfully met the College's standards of laboratory performance and the established criteria of an intensive, on-site inspec-

tion by an examiner of the College.

"This accreditation," emphasized Dr. Reals, "reflects credit to the institution and means assurance to patients and physicians of the accuracy and precision of the laboratory's services."

The Inspection and Accreditation program of the Chicago-based College is recognized as one of the most outstanding medical peer evaluation systems in the world. Its goal is to promote the best possible laboratory performance via a program which examines and evaluates all phases of a laboratory's operation.—PAO, NRMCM, Portsmouth, Va. ☛

AMA CONFERENCE ON DRUG ABUSE

A conference on Medical Complications of Drug Abuse was presented by the American Medical Association (AMA) at the Washington Hilton Hotel, Washington, D.C., on 7 Dec 1972. The conference coordinator and Moderator for the morning program was CAPT William M. Lukash, MC, USN, White House Physician.

Physicians are learning that drug abuse has become widespread and can get victims into other deep medical trouble unless attending physicians are aware of the patient's drug history.

Richard S. Wilbur, M.D., Assistant Secretary of Defense (Health and Environment) actively participated in the morning session and spoke on "Drug Abuse in the Armed Services."

J. Willis Hurst, M.D., Chairman of the Department of Medicine at Emory University, Atlanta, addressed the cardiac complications of drug abuse. Drug abusers' contaminated needles are one of the leading causes of bacterial endocarditis in this country, and this condition gravely increases the user's risk of death if he must undergo heart surgery.

According to Michael M. Baden, M.D., New York City's deputy chief medical examiner, 1300 narcotic abusers died in the past year in N.Y.C. The majority of autopsies now indicate that many victims have other drugs in their body tissues besides heroin. This may have vastly complicated their medical treatment.

Dr. Baden reported that many addicts died after having been sent home from a hospital where they had "responded" to an injection of nalorphine, a test for heroin use. Deaths resulted because nalorphine augmented the respiratory depression caused by methadone or barbiturates which had also been taken. Medical observation for a period of at least 24 hours is necessary to prevent such deaths.

H.J. Zimmerman, M.D., Chief of Medical Services at VA Hospital, Washington, D.C., was the moderator for an afternoon panel on hepatitis and drug abuse. The known incidence of hepatitis associated with drug abuse continues to rise. Many drug users present no overt evidence of hepatitis and continue to sell disease-contaminated blood.

Claude H. Organ, M.D., Professor and Chairman, Dept. of Surgery, Creighton University, Omaha, Neb., discussed the surgical management of drug abusers who may seriously injure themselves on "bad trips" related to psychedelic drugs.

CAPT Lukash pointed out that the objective of the symposium was to alert the physician and assist him in selecting appropriate medical management. No attempt was made to preach or moralize about social inadequacies of the individual, family or society which have led to the current drug problem. "Although the drug user may consider the physician a part of the establishment," Dr. Lukash commented, "drug abuse control and prevention has a much higher chance of success if a doctor shows his willingness to educate himself, and to deal on a personal basis with youth."

The program for the conference was acceptable for seven credit hours in category II for the AMA Physician Recognition Award and seven elective credits for the American Academy of Family Physicians. ☸

USAF-USN PHYSICIAN'S ASSISTANT PROGRAM

The Navy has entered its second class of Physician's Assistant students at the School of Health Care Sciences, Sheppard AFB, Tex. This class includes nine men and one woman from the Hospital Corps. They bring the total number of Navy students in this program to 18. The Navy plans to enter between ten and 20 students in this program every four months, and thus will eventually be graduating 30 - 60 Physician's Assistants per year. The Air Force will have 90 graduates annually. A second Navy Physician's Assistant Program at the George Washington University, Washington, D.C. will provide 15 graduates per year, the first class having convened in Sept, 1972.

The USAF-USN program includes one year at the USAF School of Health Care Sciences followed by a one-year clinical clerkship at one of eight naval hospitals. Graduates of this program will be eligible to receive a baccalaureate degree from the University of Nebraska as soon as they fulfill certain other curriculum requirements.

The eight naval hospitals selected for the USAF-USN

program participants are located at Camp Lejeune, N.C.; Charleston, S.C.; Jacksonville and Pensacola, Fla.; Great Lakes, Ill.; and Long Beach, Camp Pendleton, and San Diego, Calif. Tentative plans call for the Physician's Assistant graduates to remain at these hospitals for their first tour of duty following completion of training. The George Washington University program will utilize the naval hospitals at Portsmouth, Va.; Bethesda, Md.; and Philadelphia, Pa.

The first class of eight students will complete their studies at Sheppard in June 1973. At that time they will have accumulated 1403 hours of instruction and an average of 1300 hours of outside study. In July of 1973 they will begin 13 months of extensive training in patient evaluation and patient care. When the first class graduates in June 1974, participants will be well trained for managing almost all routine outpatient care problems and they will have acquired practical experience in the treatment of trauma cases and medical emergencies. All tasks performed by them, however, will be accomplished under the supervision of a physician, either directly or indirectly.

The next selection board for candidates in this program meets in Mar 1973. Applicants should refer to BUPERSNOTE 1120 of Aug 1972 and should submit their official application between 1 Jan and 1 Mar 1973.—PAO, Naval Medical Training Institute, NMMC, Bethesda, Md. ☸

DENTAL FLAG OFFICERS HONORED

The dental officers of the 12TH Naval District hosted a dinner party in honor of the active duty flag officers of the Navy Dental Corps during the 103rd Annual Session of the American Dental Association (ADA). The event was held at the Marines' Memorial Club in San Francisco, Calif., on 30 Oct 1972.

All the active duty dental flag officers were among the 200 dental officers and wives who attended the gala occasion.

The flag officers in attendance were:

RADM Myron G. Turner, DC, USN;
RADM John P. Arthur, DC, USN;
RADM Vernon L. Anderson, DC, USN;
RADM Anthony K. Kaires, DC, USN;
RADM Wade H. Hagerman, Jr., DC, USN;
RADM Herman P. Riebe, DC, USN (Ret.);
RADM Maurice E. Simpson, DC, USN (Ret.);
RADM George J. Coleman, DC, USNR-R;
CAPT George D. Selfridge, DC, USN (Rear

Admiral Selectee); and
 CAPT Roman G. Ziolkowski, DC, USNR-R (Rear
 Admiral Selectee).
 CAPT David V. Castner, DC, USN, is the 12TH
 Naval District Dental Officer.
 Some candid photos of the participants follow.



RADM John P. Arthur, DC, USN, BUMED Assistant Chief
 for Dentistry and Chief of the Navy Dental Corps.





NAVY FLAG ADORNED—CAPT William A. Schrader (center), the Navy Deputy Director of AFIP, added a cluster of 27 streamers to the Navy flag at a ceremony held in the AFIP Director's Conference Room on 7 Nov 1972.

BATTLE STREAMERS ON NAVY FLAG AT AFIP

The Chief of Naval Operations has authorized the Armed Forces Institute of Pathology (AFIP) to display a set of battle streamers on its U. S. Navy flag. Authority to display battle streamers is restricted to a select list of activities. The Institute has been honored to have its name added to this highly esteemed list.

At a ceremony held in the Director's Conference Room, CAPT William A. Schrader, the Navy Deputy Director, added another visual dimension to the Navy flag with a cluster of 27 multicolored streamers. Now, the Navy flag stands proudly beside the flags of her sister services, all bedecked with a colorful array of streamers which serve as symbols of the dedicated and heroic performance of all the military branches.

In Jan 1971, the U. S. Navy joined the other military services in the use of battle streamers. Commenting on the meaning of the new streamers displayed with the Navy flag, Admiral Elmo R. Zumwalt, Jr., the Chief of Naval Operations, said that "ships and men who performed so gallantly in the American Revolution, at Tripoli, Lake Champlain, Manila Bay, on Atlantic convoy, at Midway, Leyte, in Korea and in Vietnam will be honored and esteemed through succeeding generations."

To date, 27 streamers with 23 silver stars and 33 bronze stars to commemorate the wars and combat actions of the Navy during its proud history have been approved. These symbolize 157 campaigns and major battles, and the many unit citations and commendations

which have been approved. Silver and bronze stars are embroidered on streamers to denote engagements of a campaign, and numerals on unit award streamers denote the total number approved.

The U. S. Army adopted battle streamers in 1920, the first American military service to initiate their usage. They were introduced into the Marine Corps in 1939, and in 1956 the Air Force followed. In 1968 the Coast Guard authorized use of battle streamers.

Many of the practices relative to streamers and their display are similar among the services. There are differences, however, particularly regarding the number of streamers and use of embroidered devices.

The Army carries a separate streamer for each important action in all wars in which that service has participated. Army streamers are embroidered with the name of the action commemorated. As of 1971 the Army allowed 56 streamers, and the Air Force employing the Army system, carried 64.

Unlike the Army-Air Force practice, the Marines use one ribbon for each war, campaign, or theater of operations. Specific actions or battles are highlighted by bronze and silver stars embroidered on the ribbon. At the same time, the Marine Corps showed 42 streamers, and the Coast Guard used 27, unadorned by either stars or lettering.

Navy streamers are 3 ft. long and 2-3/4 in. wide. Where a medal has been awarded for a particular war or service, the coloring and design of the streamer are the same as the ribbon from which the medal is suspended. Conflicts and operations for which no medal was issued are represented by ribbons specially designed for use as streamers.

Today's battle streamers affixed to the military flags of the U. S. are colorful symbols and reminders of sacrifice, service and a proud heritage—a tribute to the men and women of the armed forces, past and present, who have responded in America's times of need.—PAO, AFIP, Washington, D.C. 🍀

UNIFORMED SERVICES MEDICAL/DENTAL SCHOOL

President Nixon has signed a bill clearing the way for a uniformed services medical and dental school, as well as a comprehensive new medical/dental scholarship program.

The bill was signed 21 Sept 1972 and authorized establishment of a uniformed services university of health sciences within a 25-mile radius of Washington, D.C. Students will be commissioned officers on active duty in grade O-1. Upon graduation, they will serve at least seven years on active duty, in addition to the time spent in military residency or internship.

The new medical and dental scholarship program is open to students who have been accepted or are enrolled in an accredited medical or dental school. Persons accepted for the program will serve on inactive duty as Reserve officers in grade O-1, with a monthly stipend of \$400.00

At least one year of active duty obligation will be required for each year of participation in the scholarship program, exclusive of the time spent in military residency or internship. 🍀

ALCOHOL REHAB CENTER (ARC)

The Navy's East Coast Alcohol Rehabilitation Center (ARC) officially moved into new quarters at the Norfolk Naval Station, Norfolk, Va., on 11 Dec 1972. The ARC was established in Jan 1972 and was formerly located at the Naval Amphibious Base, Little Creek.

The new facility contains four-man living quarters, classrooms, office space and an assembly hall. It is staffed by officers, senior enlisted men and civilian counselors. Up to 75 patients can be treated there at a time.

Similar to the Great Lakes and Long Beach areas, Norfolk offers rehabilitation programs for Navy, Marine Corps and Coast Guard personnel who suffer from alcoholism. The Navy ARCs are not regarded as hospitals or disciplinary facilities; ARCs are clinics which serve to bring alcoholics back to useful and productive roles in naval service.

Patients at the ARCs receive counseling from recovered alcoholics and attend meetings of *Alcoholics Anonymous* in nearby communities. A fourth ARC is planned for the San Diego area.—CHINFO NEWS-GRAM (49-72). 🍀

Voltaire is credited with having written that "Prejudice is the reasoning of the stupid." Philosophers have long found beauty in logic. Montaigne held that "The most profound joy has more of severity than gayety in it." 🍀

OFFICIAL INSTRUCTIONS AND DIRECTIVES

BUMEDINST 6320.47 of 31 Oct 72

Subj: Subsisting out

Recently, confusion has been experienced in the differentiation of the patient who is granted commuted rations and those who are allowed to subsist out. To provide a uniformity in definition and procedures, the following policy statement is considered necessary.

a. Subsisting out is a category in which officer or enlisted patients on the sick list may be placed when their daily presence is not required for treatment or examination, but who are not yet ready for return to duty. As a general rule, patients placed in this category should reside in the area of the hospital and should be examined by the attending physician at least weekly. Enlisted personnel placed in a subsisting out status should be granted commuted rations.

b. Patients in a subsisting out status should not be confused with those enlisted personnel in a rehabilitation program who are granted liberty and are drawing commuted rations, but are required to be present at the hospital during normal working hours. These personnel are not subsisting out and must have a bed assigned at the hospital.

c. Patients who are required to report for examination and treatment more often than every 48 hours should not be placed in a subsisting out status.

BUMEDINST 6401.1 of 2 Nov 72

Subj: Military veterinary medical support to naval activities

Due to the increasing numbers of military veterinary personnel (Army or Air Force personnel) assigned to Navy and Marine Corps activities, it is necessary to establish a uniform policy for requesting and utilizing these support services.

Veterinary service personnel will normally function in the organization of the command medical department to provide professional and technical skills inherent in veterinary science in developing and operating subsistence inspection and evaluation, veterinary medical and surgical services, and research and development programs.

The Army and Air Force shall retain responsibilities for maintenance of records of their respective personnel. Upon request, local activities shall provide necessary disbursing, medical and dental services, record management and other services normally provided all other personnel assigned to the activity.

Naval activities requiring veterinary subsistence inspection personnel support shall submit a "Request for Veterinary Services" to BUMED (Code 72) via the Navy Subsistence Office, for approval and transmittal to the appropriate service. Requests for veterinary research support shall be transmitted directly to BUMED (Code 72).

BUMEDINST 6470.13 of 10 Nov 72

Subj: Microwave health hazard; control of

The variety of electronic equipment employed by today's Navy for communications, surveillance, and research is continually increasing in quantity, complexity and power. Electromagnetic radiation emanating from this equipment constitutes a potential health hazard unless adequate precautionary measures are taken.

This instruction outlines the potential health hazards associated with the use of microwave equipment (including radar); specifies maximum personnel exposure levels; cites precautions to be taken to insure the safety of personnel; and, provides guidance for medical surveillance.

If an individual has been exposed in excess of the stated microwave limits, the commanding officer shall prepare a letter report, Microwave Overexposure Incident (MED 6470-11), and forward it via the chain of command to Chief, BUMED (Code 74), within 30 days of the incident. If the exposure is approximately an order of magnitude (factor of 10) greater than the stated limits, an interim message report should be forwarded to Chief, BUMED, within 48 hours of the incident.

BUMEDNOTE 6600 of 25 Oct 72

Subj: Dental Service Report, DD 477 (Report Symbol MED 6600-2); change to

The DD 477 has been utilized in a varying manner by the uniformed military dental services. In an effort to establish a one-line item on subject report which will be reported uniformly by the Army, Navy and Air Force Dental Corps, DOD has directed that line 52 (Total Patients Treated) shall represent the total number of patients who received dental care in a dental treatment facility during the reporting period.

A patient is a person who visits a dental treatment facility for dental care. No person will be counted as

a patient more than once per day. Dental care is any examination, consultation, treatment, instruction, or combination thereof (radiographs are excluded).

The below changes to the DD 477 were effective 1 Oct 72:

a. Line 52 will be used to record "Total Patients Treated."

b. "Total Sitzings" will henceforth be recorded on line 50 (vice 52).

c. All hospitals shall also enter in column G, lines 50 and 52, the appropriate totals for hospital inpatients.

BUMEDNOTE 6710 of 24 Oct 72

Subj: Control and use of hexachlorophene products

Present data do not support a safe and effective over-the-counter use for hexachlorophene. Items containing hexachlorophene content over 0.1% (preservative strength) are now available on prescription only.

Indications for use of these items are: as a bacteriostatic skin cleanser for surgical scrubbing or hand-washing, as part of patient care, and for topical application to control an outbreak of gram-positive infection where other infection procedures have been unsuccessful.

These items are contraindicated for use on burned or denuded skin, or on mucous membranes, or for routine prophylactic total body bathing.

Issue on prescription only those items containing more than 0.1% hexachlorophene. Identified standard supply items include (FSN 6505-):

- 935-1001 Sulfur, Hexachlorophene, and Polyoxyethylene Laurel Ether Cream, 28.7 Gm.
- 890-1634 Hexachlorophene, Salicylic Acid and Sulfur Cake, 3-3/4 oz.
- 985-7256 Soap, Surgical, 1-3/4 oz., 12s.
- 141-1900 Soap, Surgical, 4 oz.
- 141-1950 Soap, Surgical, Liquid, 1 pt.
- 141-1960 Soap, Surgical, Liquid, 1 gal.
- 116-1740 Detergent, Surgical, 5 fl. oz.
- 116-1750 Detergent, Surgical, 1 gal.
- 753-9611 Hexachlorophene, Salicylic Acid, and Sulfur Ointment, 4-1/2 oz.
- 181-7489 Shampoo, Hexachlorophene, Salicylic Acid, and Sulfur Lotion, 4 fl. oz.
- 959-4421 Shampoo, Coal Tar Extract, Hexachlorophene, Salicylic Acid and Sulfur Lotion, 4 oz.

EXCEPTION:

FSN 6505-246-6327 Alpha-Cellulose, Aldioxa, Hexachlorophene, p-Chloro-m-xyleneol, and Talc, 2 oz.

The following information shall be added to the immediate label of such items:

"Special Warning: This compound may be toxic if used other than directed. Rinse thoroughly after use. Monitor patients closely for toxicity symptoms."

BUPERSNOTE 6710 of 24 Oct 72

Subj: Drug Abuse Education Kits; information concerning

This notice promulgates information concerning reordering of materials contained in Drug Abuse Education Kits which are being distributed by the Human Resource Development Project Office (HRDPO) in BUPERS. These drug information kits are supplied as a part of a drug information package (consisting of a Super 8mm projector, films, and the drug abuse education kit) which is being distributed on a ratio of one package for each 200 persons in the Navy. The drug information kit itself is the size of a brief case and contains an audio cassette player, audio cassettes, pamphlets, and books.

The initial Drug Information Kits distributed contained pamphlets (Trade Name KWIK-FAC) as books and audio tapes. These pamphlets are no longer being distributed, nor should they be ordered by individual commands.

Pamphlets, books, and tapes are now available for issue as I cognizant material and may be immediately ordered from the Naval Publications and Forms Center, 5801 Tabor Ave., Philadelphia, Pa. 19120, under the stock numbers indicated on next page.

Procurement of complete replacement Drug Information Kits from any source should not be made until a clearance to do so is obtained from the Human Resource Development Project Office, Dept. of the Navy, Washington, D.C. 20370 (Tele: Commercial (202) 697-4852/55; Autovon 227-4852/55). Commands desiring replacement of materials should order them as indicated above.

Pamphlets

<i>Marijuana Some Questions and Answers</i>	0503	900	1950
<i>The Up and Down Drugs</i>	0503	900	2000
<i>Heroin</i>	0503	900	1900
<i>LSD Some Questions and Answers</i>	0503	900	2025
<i>Stimulants Some Questions and Answers</i>	0503	900	2035
<i>Narcotics Some Questions and Answers</i>	0503	900	2030
<i>Drug Abuse—Game Without Winners</i>	0502	076	1700
<i>Answers to the most frequently asked questions about drugs</i>	0503	900	2060
<i>Volatile Substances</i>	0503	900	2040
<i>If You Want to Give Up Cigarettes</i>	0506	500	0300
<i>Is AA for You</i>	0506	500	0310
<i>The Alcoholic Is A Sick Person</i>	0506	500	0320

Books

<i>Drugs On College Campus</i>	0506	350	0000
<i>Marijuana—Signal of Misunderstanding</i>	0506	350	0100
<i>Drugs of Abuse</i>	0506	350	0050
<i>The Drinking Problem</i>	0506	500	0100
<i>The Drinking Game And How To Beat It</i>	0506	500	0110
<i>The Pleasure Seekers</i>			
Grove Press Edition	0506	500	0120
<i>The Psychedelics</i>	0506	500	0130
<i>Drugs from A to Z: A Dictionary</i>	0506	500	0140

Tapes

<i>Introduction to Kit—USN Programs and Policy</i>	0506	500	0200
<i>Drugs—An Overview/ Medical Aspects</i>	0506	500	0210
<i>Alcohol/Treatment Modalities</i>	0506	500	0220
<i>Heroin/Tobacco</i>	0506	500	0230
<i>Marijuana/Hallucinogens</i>	0506	500	0240
<i>Barbiturates/Amphetamines</i>	0506	500	0250
<i>Drugs and Youth Culture</i>	0506	500	0260



✠ In Memoriam ✠

RADM Robert O. Canada, Jr., MC, USN (Ret.) died on 5 Dec 1972 after suffering a heart attack while on vacation in Tokyo, Japan. He was born 16 July 1913 in Grottoes, Va. Dr. Canada graduated from the University of Virginia and the University of Virginia Medical School.



He was commissioned LT(jg), MC, USN in July 1938 and after serving his first tour of duty as a ward medical officer at the Naval Hospital, Portsmouth, Va., he reported aboard the *USS Salinas (AO-19)*. Dr. Canada was Medical Officer aboard that ship when it was torpedoed by a German submarine on 30 Oct 1941 off the coast of Iceland prior to the outbreak of WW II.

Dr. Canada served as Senior Medical Officer aboard the *USS Pasadena (CL-65)* which participated in several of the THIRD and FIFTH Fleet operations in the Pacific combat area. The *Pasadena* was in the Tokyo Bay area during the Japanese surrender and subsequently participated in the occupation of Japan.

In Oct 1947, Dr. Canada assumed duties as Head of the Tuberculosis Control Section, BUMED, and in

1950 he joined the staff at the Naval Hospital, NNM, Bethesda, Md., as Assistant Chief of Medicine and Head of the Chest Disease Section. Dr. Canada later served at the naval hospitals in Charleston, S.C., and Oakland, Calif., as Chief of Medicine. After commanding the Naval Hospital, NAS Jacksonville, Fla., he returned to command the Naval Hospital, NNM, Bethesda from Feb 1962 to Feb 1965, when he assumed the office of Deputy and Assistant Chief of the Bureau of Medicine and Surgery. In Mar 1968, ADM Canada once again returned to Bethesda and assumed command of the National Naval Medical Center, serving in that capacity until his retirement on 1 Aug 1969.

Dr. Canada specialized in pulmonary diseases and was a nationally recognized expert in that field. He was a pioneer in the antibiotic treatment of tuberculosis and for many years was engaged in research activities, particularly in emphysema.

Dr. Canada was a Diplomate, American Board of Internal Medicine; a Fellow of the American College of Physicians and the American College of Chest Physicians; a member of the American Thoracic Society, the American Medical Association, and the Clinical Climatological Medical Society.

For his exceptionally meritorious service as Deputy and Assistant Chief of the Bureau of Medicine and Surgery from Feb 1965 to Mar 1968, ADM Canada was awarded the Legion of Merit; in lieu of second award for exceptionally meritorious service as Commanding Officer of the NNM, he was awarded a Gold Star. Other awards included the American Defense Service Medal with Bronze "A"; American Campaign Medal; Asiatic-Pacific Campaign Medal with one Silver Star and one Bronze Star; WW II Victory Medal; Navy Occupation Service Medal with Asia Clasp; National Defense Service Medal with Bronze Star; and the Philippine Liberation Ribbon with one Star.

Following retirement from the Navy, Dr. Canada was a member of the staff at the Medical Clinic, Greenbrier Hotel, White Sulphur Springs, W.Va. He is survived by his wife, Julia, of Lewisburg, W.Va.; a son, Robert O. Canada III, of Utica, N.Y.; his mother, Mrs. Robert O. Canada Sr., of Grottoes, Va.; and a sister, Mrs. John O'Donnell, of Orlando, Fla.

and did postgraduate work in cardiology at London University.

CAPT Hyman served on active duty in the Pacific during 1941-42 and in 1943 was the chief medical officer of the Navy's mobile hospital in New Zealand. He retired from the Naval Reserve in Sep 1955.

Dr. Hyman was a cardiologist and in 1932 introduced his "pacemaker," the forerunner of the modern devices in use today, at a meeting of the American Congress of Physical Therapy in New York.

Surviving Dr. Hyman are his wife, Lillian, and a brother, Joseph Hyman.

CAPT John W. Rogers, MC, USN (Ret.) died 14 Oct 1972 in Melbourne, Fla. He was born on 17 Apr 1903 in Bloomingburg, Ohio. Dr. Rogers graduated from Ohio State University and received his M.D. degree in 1926 at the School of Medicine there. After graduation from ROTC Unit in 1926, he held a commission as a 1st LT in the U.S. Army Reserve until transfer to the Medical Corps of the Naval Reserve in 1935, with the rank of LT. Prior to reporting to active duty, Dr. Rogers practiced medicine in New York from 1930 to 1941, specializing in urology and urological surgery.

Dr. Rogers was called to active duty in Jan 1941 and reported to the Naval Training Station, Naval Operating Base, Norfolk, Va. In Jan 1942 he reported to the Naval Hospital Pearl Harbor, T.H., serving there until Nov 1943. After returning to the U.S., he was designated Chief of Urological Service at Naval Hospital Brooklyn, N.Y. In July 1946 CAPT Rogers transferred to the Medical Corps USN, from the Medical Corps USNR. Dr. Rogers also served as Chief of Urology Service at the Naval Hospitals Philadelphia, Pa.; Oakland, Calif.; and Chelsea, Mass., where he also assumed duties as the executive officer in 1956. He later served as executive officer and Chief of Urology at the Naval Hospital Portsmouth, N.H., before assuming command of that hospital. In Sept 1958, he became District Medical Officer, First Naval District, where he served until his retirement in Jul 1960.

Dr. Rogers was a Diplomate of the American Board of Urology; a member of the American Medical Association; the American Urological Association; the New York Academy of Medicine; the Pan American Medical Association and the Ohio Society of New York. He held the U.S. Naval Reserve Medal, the American Defense Service Medal, the American Campaign Medal, the Asiatic-Pacific Campaign Medal and the World War II Victory Medal. 🇺🇸

CAPT Albert S. Hyman, MC, USNR (Ret.) died 8 Dec 1972 at Mount Sinai Hospital in New York City. He was born in Boston, Mass., on 6 Apr 1893. Dr. Hyman graduated from Harvard College in 1918

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RADM ARTHUR HONORED

RADM John P. Arthur, DC, USN recently was awarded the Meritorious Service Medal for his performance as Inspector General, Dental. Dr. Arthur, who as the Chief of the Dental Corps is the Navy's number-one Dental Officer, received the award from VADM George M. Davis, MC, USN, Surgeon General of the Navy in ceremonies held at the Bureau of Medicine and Surgery in Washington, D.C. The citation accompanying the award read in part: "Rear Admiral Arthur's superb performance . . . was instrumental in improving the level of dental health of the Navy and Marine Corps through recommendations made in conducting the dental inspection program . . . throughout the world. . . . By his exceptional professional ability, outstanding leadership . . . and devotion to duty, RADM Arthur has made significant contributions to the Navy Medical Department."

Dr. Arthur, who is a graduate of North Pacific Dental College in Portland, Oregon, was appointed Chief of the Navy Dental Corps on 1 Jul 1972. During his 31-year naval career he has served at a variety of duty stations ashore and afloat. In addition to the Meritorious Service Medal he holds the Presidential Unit Citation for service with the First Medical Battalion, First Marine Division during the Korean War and numerous campaign ribbons. Admiral Arthur is a member of the American Dental Association and Delta Sigma Delta Professional Fraternity, and a Fellow of the American College of Dentists.—PAO, BUMED, Washington, D.C.



WELL DONE — RADM Arthur is congratulated by the Surgeon General of the Navy, VADM George M. Davis, after being presented the Meritorious Service Medal in ceremonies held in the Surgeon General's office at the Bureau of Medicine and Surgery, headquarters of the Navy Medical Department.



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WHAT DO YOU SAY? — Master Chief Hospital Corpsman Robert J. Swartout, Senior Enlisted Advisor to the Navy Surgeon General, conducts a rap session with HN Linda Kirby (left), HN Thomas Kunkel and HN Ronald Duckett (right), during a visit to the Naval Aerospace and Regional Medical Center (NARMC) in Pensacola.—PAO, NARMC, Pensacola, Fla.

U.S. NAVY MEDICINE